COMPUTERWORLD

INSIDE

Executive Report -Can CASE cure your development life cvcle blues? Page 73

In Depth — MIS managers: Take that new 4GL for a spin. Page 89

U.S. computer industry scrambles to avoid impact of tariffs against Japan. Page

NCR users preview interfaces across product lines. Page 2 Chemical Bank moves ahead of software industry

with distributed data base system. Page 8. ADC2 users win reprieve;

Uccel pledges continued support. Page 15. Clone vendors resist once cuts as market awaits fur

ther IBM moves on PC XT. AT lines, Page 6. Tandem to roll with Unix. CMOS distributed systems.

Page 10.

Wang turns a profit as industry rebounds. Pages 103, 125.

Draft survey on micro buying scores hassle of upgrade

process. Page 33. "I want my MTV. No. I want my MISTV." Page 97.

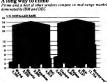
Mainframe users express confusion over expanded. solid-state storage options.

Prime powers up to 3090 range

BY JAMES CONNOLLY

NATICK, Mass. - Prime Com puter, Inc. leapfrogged archryal Digital Equipment Corp. last week with a pair of superminicomputers teaturing perfor-mances that Prime claims surpass those of DEC systems an pst Prime machines against IBM Prime said it hopes to use the 6350 uniprocessor and 6550

A long way to climb



growth path for its user base which is heavily oriented toward CPU-intensive applications such as computer-aided design, and to attract new general-business customers of the type often served by mainframes.

We are not positioning these as mainfrance systems and we certainly don't expect to go after the entire IBM market." said

Dick Snyder, vice-president of software development at Prime Snyder was quick to add that the 6350, rated at 11.8 million instructions per second, and the 6550, rated at 23.6 MIPS, drive Prime's product line past performance of the IBM 4381 and into the range of the IBM 3090 Models 150E and 180E. Prime's performance claims also surpass those of DEC for its high-end uniprocessor, the 6-MIPS VAX 8700, and its 12 MIPS VAX 8800 dual processor

Prime claimed the 6550's archi tecture is more efficient than minicomputer multi-Continued on page 4

Multiuser support in OS/2 plan

BY DOUGLAS BARNEY

MONTVALE, N.J - IBM plans to evolve its microcomputer Operating System/2 to include niul truser capabibities, IBM officials cardiact week

"It is our intent to winner multiwer capabilities eventually on OS/2." said William Lowe president of IBM's Entry Sys-

Silver lining IBM funt-quarter profits were down, but company spirits are rising. DEC con-tinues to soar. Page 125.

tems Dwisson. Officials from both IBM and Microsoft Corp confirmed that IBM is mount toward providing multiuser fea-However, they declined to give a time frame for those develop-

This strategy will untold or an extended period of time. The hase OS/2 multitasking operating system, which can address up to 16M tytes of random-access memory, will itself not be available until the first quarter of 1988

Although Microsoft, principal developer of PC-DOS and OS/2, once vehemently demed that DOS would evolve into a Continued on page 6

Apollo welcomes others to Domain Environment made network independent, adapted for IEEE Ethernet

802 4 token has or 802 5 token.

BY ELISABETH HORWITT CHELMSFORD, Mass. - Re-

sponding to user demand for lower cost and standardized networking. Apollo Computer, Inc. announced last week that it has ported its Domain coming environment onto the IEEE 802.3 Ethernet local-area net work, with support for other standard networking environments uncoming

Apollo has made Domain 'network independent" by iso lating higher level software functions, such as file access and data transport, from the two lower levels that define Apollo's pro prietary 12M bit/sec. token-ring LAN, explained Michael A. Gal-lup, Apollo's director of product

As a result, the Domain networking system, which prosides transparent distributed file access across the network, can be ported to a variety networking standards, Gallup said. "We started with Ethernet because it is the most widely in-

ring as demand justifies," he ex-In November 1986, Apollo nounced an Ethernet Gateway that allows Domain workstation on its proprietary token ring to communicate through one workstation with other ven-Continued on page 125

ETA goes to school, preps for entrance

BY JAMES CONNOLLY

TALLAHASSEE, Fla. - Soft ware problems will keep the first field-test model of ETA Systems, Inc.'s ETA-10 super computer from being ready for customer acceptance as sched uled for June. But those problems will not prevent the user of that model from completing a supercomputing center buil around the ETA-10, which is

be introduced next week The first CPU in what eventually will be a four-CPU com plex was delivered to Florida State University in January and the second processor was wheeled in during the latter part of March

The ETA-10 is the first maor product to be announced by the 4-year-old Control Data

Corp. spin-off When configured with the maximum eight CPUs, the

ETA-10 reportedly will soar past the performance levels of Cray Research, Inc 's Cras-2 Cray Research, Inc. s Cras-2 An eight-CPU ETA-10 was designed to perform about 8 bilion floating-point operations per second, compared with 2 GFLOPS for the Cray-2 Each processor cabinet in ludes memory, cabling, con

trullers and a liquid nitrogen coolant tank that chills circuits to 320 degrees below zero Eshrenhert Each Florida State CPU has 4 million words of The university also will use ETA Systems' shared memory unit, which eventually will allow the four CPUs to a Continued on page 13

IN THIS **ISSUE**

And now, the good news. Wang surpasses its break-even target, posts its first quarterly profit of the fiscal year and rolls out an integrated image processing system that combines image processing with DP, office automation and communications capabilities. Pages 12, 103.

NEWS

- 4 IBM claims supercor puting advance based on lo sephson sunctions devices chilled by liquid nitrogen 6 IBM's PC price cuts ex-
- ert little pressure on compatible vendors
- 6 Retailers slash prices on w-moving PS/2s
- 7 Phoenix Technol contemplates 32-bit AT bus extension companhie with third-party add-on boards
- 8 Chemical Bank builds rwn distributed system furthers its relationship banking strategy
- 10 Tandem systems bring distributed computing to pr yously impractical sites
- 14 Users turning to gen eral-purpose vendors for lowor coat Al contamo 15 Forel decides to con-
- tinue support of ADC2 main frame scheduling software 19 Ashton-Tate designs
- Multimate Advantage II for new class of users. 19 Xerox adds printer-
- less models to deskton line 125 Industry financial results surpass analysts' expec-
- tations, indicate upturn 125 Microsoft nearly doubles revenue remains leader in micro software endor market
- 125 Pending actions to Cornel acquisition offer.
- 126 Computer Consoles extends technology of super-
- 126 Industry awarts final trade sanctions decision SOFTWARE &

SERVICES

- 25 IBM changes the rules on small system-software vendors
- 25 Renaissance office system reflects multilavered work flow
- 25 ADR offers interface between E-mail system and

Will CASE trestucts deliver?

- MICROCOMPUTING 33 Apple aims to meet MIS head-on.
- 33 Benchmarks probe floating-point speed accura ry of Basic systems
- 33 Corporate buyers are not happy with software man-

NETWORKING

- 43 Olsen's MAP attack few friends. Standards organiza-
- tions lack user voice 43 Users forget 'people technology

SYSTEMS & PERIPHERALS

- 55 Wang adds ministron puters to Tempest line
- 55 Managers find storage options confusing.
- 55 Intel sweetens scren tdic line with Sugarcube 55 DEC doubles memory of VAX 8600 and 8650 super-

Quotable

he Macintosh office was an idea a little bit ahead of its time. It showed our naivete in terms of what it took to develop communications broducts.

> CHADIES SEDVED VICE PRESIDENT OF SINESS DEVELOPMENT APPLE COMPUTER INC

MANAGEMENT 9.7 Bank of Boston's top information systems exec

takes wing 97 Information systems managers want their MIS

97 Committee arms to curtail use of employee surveillance systems

COMPLITER INDUSTRY 103 Wang NCR others

- post promising carnings 103 Computer Asso crates purchases ailing BPI.
- 103 Sorbus exec says IBM service strategy is don
- EMPLOYMENT TODAY 108 Retailers offer MIS professionals plethora of op-
- portunities. **EXECUTIVE REPORT** 73 CASE tools vendors
- promise a revolution in softthey deliver? By Jun Huling.
- IN DEPTH 89 On the road: Testing new rooks can make you feel like a young programmer

again By Daniel Nolan. **OPINION 8**

- ANALYSIS 21 Withington like to the systems professional to Bob Cratchit
- 25 Finklestem scrutinges SOI standards
- 33 Zachmann reviews the Zoom/Modem line Keefe keeps an eye on the battle of the LANs
- 55 Beeler separates the bigots from the chauvinists 97 Mitchell likes thinking
- 103 Wilder reviews Forbes' and Fortune's corporate rankings

DEPARTMENTS 20 Editorial

100 Calendar 120 Buy Sell Swap

NCR gives early peek at transaction system links

8Y JEAN S. BOZMAN

CHICAGO - NCR Corp. last week provided users with an ear ly look at interfaces that will link the firm's \$500 and Towns how with its 9800 transaction processing system

The interfaces should help the NCR 8500 and Tower be come building blocks of an ex tended NCR 9800 system, the company said. The interfaces nonstrated at the Nacon-87 NCR Users Conference here last week, will not be formally unced until later this year The two interfaces should be ulable before the end of the

year, according to NCR managers who developed them A link between the NCP 8500 computer and the NCR 9800 is ready to go into beta testing, according to Gary C. Mathews di rector of marketing support for NCR's engineering and manu

facturing group in San Diego. Mathews explained that the interface works by linking the buses of the two computers. "A system bus adapter allows us to connect some models of the 8500 to the bus of the 9800

When they're attached, the 8500 runs the VRX/E operating system, just like the 9800 does As a result, the 8500 functions identically to any of the other at tached processors in the 9800 complex." Mathews explained It's hardware and firmware

that does the interconnecting and the user does not have to change the operating system or the applications in order to use the interface," said David J. Olivet, director of product manage ment at NCR's San Diego devel-

opment center The interface that links Tow

er municomputers to the NCR 9800 will not require the attached Tower to run VRX/E something that all other 9800 attached processors must do. Instead, the Tower will continue to run its Unix operating system. As far as the Tower's con cerned, system memory beomes just another file device or I/O driver," said Keith Vezel, a software specialist who pres ed a Nucon:87 seminar on NCR 9800 file structures Variations of the 8500 meer-

face that are currently being developed should allow users of the NCR 8600 and NCR 8800 sys tems to link their computers to the NCR 9800. But those interfaces may not appear for more than a year. Mathews said Srill users are paying close attention. The ability to use the NCR 8800 as a backup system to the NCR 9800 interests me." Larry Hocking, director of data ocessing at Euclid General Hospital in Euclid, Otso. Hock mg, who has an NCR 8565 and an NCR 9050 in his computer room, said he is considering the addition of an NCR 9800 as a pri-

TOP reaches new peak Expanded system supports X.25 and token bus

dard as an alternative medium BY ELISABETH HORWITT However, as the ong

Version 3.0 of the Technical Of fice Protocul (TOP) networking standard was released last week by Boeing Computer Services IEEE 802.4 token bus 802.5 token ring and CCITT X.25 protocols as well as addr tional networking functionality, a Boeing spokesman told Com

Like the existing TOP 20. new version supports the IEEE 802.3 Ethernet protocol as the primary media-access method for the office networking standard. However, Version 3.6 also supports the IEEE 802 5 to ken ring and X.25 nacketswitching protocols as "alternatree media the Bosins esman said.

ts the IEEE 802.4 token bus, part of the Manufacturing Auto mateon Protocol (MAP) stee

and chief developer of Boeing is sending a clear mes sage to vendors and users that the token bus "is just for those companies that want to integrate TOP on their MAP net-works," the spokesman said. "It is not among the major choices for TOP TOP Version 3.0 will incor-

porate protocols for additional networking functions, including terminal access, the CCITT X.400 electronic-messaging protocols, network man ment and directory services. Another "major new area" in cluded in the standard is interchange formats for office door ments, computer graphics and product definitions, the Boeing representative observed. TOP Version 3.0 was re-

leased by Boeing to the Society of Manufacturing Engineers. which will publish documentation of the specifications in lune



at must have been a programmer who said the only thing that remains constant is change. No sooner is a program completed than changes get made. And so many get made so often that staying in control of it all can be more than humanly possible.

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Prime EDOM DACE 1

processor technologies because Prime's CPUs share work load and memory equally, rather than using the more common master. slave relationship or the clustering approach characteristic of other vendors

Prime reportedly has been working for two years to build up sales and support teams in an pation of the 6350 and 6550. which were code-named Leon and and Panther, respectively

Snyder said that under former executive and current Prime President loe M. Henson Prime has emulated IBM in try me to sell products to the highest possible level of costomer com-

He said Prime also has develsped a capacity planning tool to help sales personnel determine which configurations customers

will need as they move into the larger systems Prime said the 6350 was do. signed to support 64M bytes of memory, and the 6550 reported ly will support 128M hytes of

However, the memories will be limited to half of those capacities for several months as Prime enhances its Primos operating system. The 6350 is available now, and the 6550 is scheduled to be delivered in the fourth-

Higher than expected Analyst Richard Mikita of Inter-

national Data Corp., a Framing ham. Mass-based market research firm, said Prime's performance numbers are high or than he expected, particularly When asked whether Prime has sufficient third-party soft-

BY JAMES CONNOLLY

YORKTOWN HEIGHTS, N.Y.

the superconducting field last

week with the announcement of

a thin-film supercunducting de-

sice based on copper-oude ma

IBM's Yorktown Heights and

on the use of two thin-film lo-

sephson sunction devices on

me-hundredth the thickness of a

human hair. The development

ame despite IBM's statement

three years ago that it was aban-

doning most of its Josephson

based devices, called Supercon-

unnerson-related work

The Josephson

The technology, developed in

IBM claimed an advance in

ware support to expand its general-purpose computing base. Mikita said. "They don't have as strong a third-party portfolio as heir competitors, but they can bring to the table something in

Mikita observed that Prime customers can feel assured by Prime's about to balance its in ternal and external product de-

velonment efforts. He said Prime has enhanced Series 50 Supermini computers, which includes the

Prime choice

Meanwhile, Cathy Van Orman, associate director of ad ministrative information sys tems at the University of Scothern Caldornia in Los Angeles, said she expected to receive

a 6350 last week Van Orman added that the system will run the school's standard benchmark and payroll and monthly financial packages dur-

Prime's 6350 and 6550 models offer greater performance over existing 5855

Typical Price: Maximum (memory) \$619,400 32M bytes me 6550 23.6 34 mer 500 \$920,700 32M byte ime 9955 [] 46 mec \$322,355

ing a test phase

en of entructum per second des CPC obereting system that storage tape for a and canada

new systems while unrisem with other vendors to develop products such as workstations and a near-supercomputer Mikita said Prime's share of the superminicomputer market

has remained stable in recent years, averaging about 3% of worldwide shipments

Two Prime customers praised the expected power of the 6350 David DeParle, marketing manager of Premier Systems, Inc. in Philadelphia, said his company weeks and that Premier's Trust Plus trust banking package runs last enough to "give us a shot at the upper end of the market that

Those payroll and monthly financial systems have been run rung on overloaded processors that are among the seven Prime 9955 It CPUs in the university's computing center

Like the year-old 9955 II, the new systems use a five-stage pipeline that handles instructions in assembly line faction, allowing the pipeline to process up to five instructions at a time. The processors are based on semi Motorola, Inc

MCA2500ECL technology which packs 2,500 gates on each The dual processors in the 6550 were designed to handle large work loads by baying each

IBM claimed that bould nitro

gen's second advantage over liq

uid helium is its lower cost IBM

said its developments were built

on 1986 breakthroughs by re-

searchers I. Georg Bednorz and

K. Alex Mueller of IBM's Zurich

made enormous progress in rais-

ing superconducting tempera

tures. We are delighted that our

researchers discovered this new

"In the past year, science has

processor take tasks from a ready list as ij completes an ear lier rob

inces activity The 6550 is a true dual processor that balances the activity of the two CPUs," said Stephen C.

Kiely. Prime vice-president of systems marketing and develop 'Rork of them can do in sat/outrest to get the highest efficiency possible in the way the omputer uses its resources Mainframes do this, too, but no

other commercially available. general-purpose supermnicom puter does, 'he added. The new systems reportedly support up to 64 disk draves each with 770M bytes of stor-

age, and up to 960 users. Prices for the 6350 are said to from \$549,000 \$665,700. The price of the 6550 from \$804 000 \$920,700.

General-purpase market Prime is focusing on four general-purpose markets in addition to the technical computing customer base that Snyder said was run ning out of raw CPU power v the previous high-end, 5-MIPS

Prome 9955 II 6550 are suited for the financial services market, which needs high-performance systems in ad-

dation to their general-purpose mainframes for applications such as modeling Snyder also listed manufacuring as a growth market for he new Prime systems, particu-

larly as controllers for diverse shop-floor systems. He said Prime boges to build n its general-purpose comput-

ing user base in the government and education sectors, in which some customers have wanted more powerful systems than Prime previously offered

CORRECTIONS

IBM salesmen did not sell all 19,000 units that came off IBM Credit Corn. Josep in 1996, an was stated in "IBM Sales of Leased Hardware Take Off ICW, April 61. Computer Dealers and Lessors Association officials say that salesmen sold only part of 19,000 total units, but de clined to say how many

Irwin Magnetic Systems, Inc. channel 12 000 tane drawn of greater than 20M byte capacity 1986 and expects to ship 60,000 this year Incorrect figures were reported in "Main taining holds on niche storage markets' [CW, April 6].

The Annual Myroone Awards ballot ICW, April 131 mcorrectly identified the supplier oi Merge/386 The correct suppher of Merge/386 is Locus Computing Corp.

COMPUTERWORLD

News Director

Products Es res Direct neter late Edi

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Moin Editorial Office 4 9071 325 Cachinger R amagina MA 61703 91

IBM heats up superconductor race New advance uses Josephson junction devices and liquid nitrogen

ducting Quantum Interference systems and instruments as well Devices (SQL'1D), were deas areas such as electric power

signed to operate at tempera tures that make superconduct ing practical. The SQUIDs are chilled using liquid nitrogen, unlike some other losenbon ninc rinn-based devices that any

cooled with board belium. IBM claimed its devices open ate at 68 degrees Kelvin, or 337 degrees below zero Fahrenheit compared with 4 degrees Kelvin

with bound belium cooling A superconductor is a material al that loses all resistance to electricity below a specific tem-

as 87 degrees Kelvin.

actually become fully supercun ductive at temperatures as high

class of superconductors, and we perature. IBM said its devices have high hopes that the materials will prove useful in a number of important areas," said Pra-veen Chaudhariok IBM Re-Superconductors are expected to be used in future computer

search Division's vice-president of science

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- 50% in Elapsed Time;
 45% in VTime;
- 55% in TTime;
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Technique (FBT). First developed in OS and DOS sorting, we've now extended the benefits of FBT to VM backups and sorts.

(2) THE BEST VM PRODUCTIVITY: SYBACK and

SyncSort CMS have tremendous operational flexibility and user friendliness. They're rich in features designed to reduce human intervention in backup and sorting

SYBACK — Automatic backup based on CP directory*
Stand-alone restore capability* Incremental backup facility*
Catalog of backup operations* Multi-tasking and execution
under CMS* Interactive command processing* Standard-label tape support* Callable by user programs* DASD to
DASD conversion and copying Much. much more

 SyncSort CMS - Sorts CMS - SMA (OS or DOS), or VSAM files - Can be invoked from COSD, LP1 or RAL programs -Dynamically allocates disk space - Selects relevant records for sorting - Reformats records on output - Performs summaries of designated numeric fields - Produces reports with pagnation, headings and dates - Can often produce smpor reports in one day rather than, say, five Much more, Loo

(3) THE FINEST TECHNICAL SERVICE: Our Technical Service specialist are experts in their individual fields. You can count on fast, efficient, courteous service in both backup or sorting operations. More than 85% of all user requests for service are resolved within 24 hours.

CAYEAT EMPTOR: As with all performance software programs, the best way to find out what SYBACK and SyncSort CMS can do is to benchmark them yourself against your present programs.

That should help you make up your mind fast!



Few PC makers worried by IBM price cuts

BY ALAN ALPER

NEW YORK - The price reductions that IBM announced on its existing line of Personal Conaggressive enough to force most major PC-compatible makers to sumediately alter their price structures, analysts and some competitors said last week However, in the long term, the IBM moves will exert pricing The price cuts, which ranged from 7% to 17% on the PC Conertible and on models of the PC XT AT and 3270 Personal Com-

puter, will have a ripple effect on

he market, noted Tom Roberts.

an analyst at International Data

Corp. a market research firm in Framingham, Mass, "I expect that it will drive (compatible ven dors' prices lower in the long run." Roberts said

But Tim Williams, director of micro/PC mformation services at Future Computing/Datapro, a Dallac-based market research firm, said IBM's price cuts and new products do little to create IBM PC-compatible vendors.

diate pricing pressure on 'It ultimately depends o what IBM does over the next 12 months with their existing prod uct line," he said. 'If they withdraw the products, it will create Yet if firms like Compressure. pag Computer Corp. and Tandy Corp continue to evolve current hardware and Microsoft Corn

MS-DOS standards to new levels of performance, pricing pressure may not be as severe as imagined. Williams suggested. So far, none of the leading PC-

mpatible vendors contacted last week have out their price raps in the aftermark of IRM's product unveiling.
Connectors Hewlett-Pack

ard Co. and Epson America, Inc slashed PC-compatible prices days before IBM's April 2 an nouncement HP cut prices by 15% on its Vectra PC Models 50 and 60, citing lower material and manufacturing costs. Epson cut tags on its Equity series an average of 9 is as part of a dealer incentive plan aimed at retaining market share Other vendors, such as Com-

pag and Tandy, said price cuts on their existing products were unnecessary at this time. It's a close-out sale the best

ce can tell." said Ed Inge Tandy's director of market planing, of IBM's price reductions. You don't drop prices when a competitor closes out its prodbe explained Compag spokesman left

Stives resterated the Houston firm's strategy of offering butter performance machines and refraining from matching IBM's price cuts, "We have no plans to react to IBM's announcement from a pricing perspective," he We've not done so in the past, and we see no reason to do AT&T, which cut prices by

12% to 16% last lanuary on its Models 6300 and 6300 Plus, said it is still evaluating the impact of IBM's pricing moves. "In the past, we have responded to changing market conditions with pricing actions," an AT&T spokesman said. "We expect to make similar pricing actions as market conditions change A spokesman for Leading Edge Corporate Products, Inc. said the firm had recently intro-

duced a removable-cartridge Winchester drive with 20M hytes of storage for its Model D PC-compatible line that lists for \$1995, including two cartridges. The company's Model 2 sells for \$1.095, and a Model D2 AT compatible with a 30M-byte hard drive will be offered for

'We've played all the cards we're going to show for now the spokesman said.

Slow-moving Model 30 prompts dealers to deal

NEW YORK - Just three weeks after its introduction, IBM's new entry-level personal computer - the Personal System/2 Model 30 - is being discounted by as much as 20% by retailers that claim the system is in abundant supply and not moving as quickly as some had anticipated.

IBM, which reportedly began nulacturing the Model 30 late last year, had the system on many retailers shelves within days of its Appl 2 debut IRM is units coursing through the dealer pipeline in anti-ination of order activity. Dealer margins are said to be about

But customer response to the Model 30 so far has been tepid. dealers said, citing user confuson over where the system fits into IBM's personal computer strategy. The system does not un the unreleased Operating System/2 — expected to be the linchpin of the other PS/2 family members - and with its 312-in disk drives, the Model 30 cannot take immediate advantage of an plications that are compatible with Microsoft Corp 's MS-DOS and that reside on 5's in diskettes without copying them onto a new disk, dealers noted Some dealers also say that the list never of the two veryoons of the Model 30 are not competitively priced communed with oth

MS-DOS machines IBM's

ted list prices are \$1,695

and \$2.295 for the dual-floppy version and hard-disk system respectively We've got thousands of them as a company, but I don't

see them selling that quickly noted Dan Court, a sales repre-sentative with a Businessland.

Walken customers can e anywhere from 5% to 15% of the list sence of the Model 30. depending on the volume pur chased, Court said, Businessland is also offering discounts to corporations that have a volume purchase agreement, he added

representative, who asked not to be identified, said his outlet has out 150 units of the dual-floopy version of the Model 30 in stock His store is offering dis rounts of up to 20% depending on the quartety purchased Since the Model 30 is pointed at entry-level users - with the

education market a primary focus - dealers may see discounting as a necessary proneering sales tactic, said Tim Williams director of nucro and personal computer information services at Future Computing/Datapro. a Dallas market research firm that tracks the computer retailing Unauthorized IBM resellers

appear to be making the most of the marketplace confusion. Olden Computer/Office Auto mation, an unauthorized IBM reseller in New York is cotting 10% off the list price of the Model 30. The base-level, dual-flop py machine is selling for \$1,525 while the hard disk-based unit is selling for \$2,095, a sales repre

And we'll do better than that, "said an Olden sales representative who declined to be identified. "We have a lot of them, but we're not seeing much activity. People don't seem sure where they fit into their plans.

Multiuser

multiuser system, the company now admits that the long-term future of OS/2 involves multruser capabilities. "It is not part of our vision for the operating system as much as it is snow thing we will do in response to customer requirements. IBM is obviously a customer for the onerating system, and we will be responding to that requirement,' said Steve Ballmer, viceresident of systems software for Microsoft

The multiuser capacity will

evolve out of IBM's more imme date plans to provide OS/2 with a high level of local-area

networking (LAN) canability "We have a number of farilities in OS/2 that allow it to sup ort multiple users on a LAN, so I would say the beginnings of multiuser are already there, said Lee Reiswig, systems manager for the communication and data management division at IBM's Entry Systems Division.

However, a multiuser version of OS/2 is a major long-term 'Some people interpret mul-

turver to really mean something like shared logic, where you could support multiple users on ASCII terrunals or dumb terms nals. That support is certainly COMPUTERWORLD

There's a long-term strategy to see the need for multiuser ca publities in the operating systern. We atterted with come of While a multiuser version of OS/2 may be years away, such a system could pro ode strong competition to the wide variety of existing Unix ini plementations. The only tines announcement IBM made at the introduction of the Personal Sectem/2 family was AIX, a propri-

going to be a ways down the Ressurg cautioned.

run on IBM's Intel Corp. 80386based Model 80 What people really want is a multiuser DOS type of environment. If there was a solid multiuser DOS implementation available, it would take away a great number of Unix sales, said Charles Hickey, president of Microport Systems, Inc., a developer of Unix products, some which also run Microsoft's MS-DOS applications as tasks But Microsoft is confident that a multiuser version of OS/2

will not cut into Unix sales Unix is fairly well entrenched as a multiuser operating system in the mid-range, and even an operating system like OS/2 would have a hard time competing in that niche," Microsoft's Ballmer

memories of the controverse that began in October 1985 when Lowe, speaking in Boston said that IBM's PC-DOS would volve into a multiuser operating system That statement brought deni-

als from Macrosoft, which in late 1985 argued that Xemx would serve as the primary multiuser operating system for microcom uters. At the time, Microsoft resident Jon Shirley and Chairman Bill Gates argued that Lowe did not mean that the PC running PC-DOS would support dumb terminals but that it would provide multifasking on a network.

ISDN team scores goals in test match

BY ELISABETH HORWITT

U.S. West, NEC Corp., North ern Telecom, Inc., Siemens A.G. and Western Union Corp anetary version of Unix that will nounced last week that they have temporarily allied to achieve two Integrated Services Digital Network (ISDN) firsts: the first ISDN-based transmis sion between two local access and transport areas (LATA) via an interexchange carrier; and the first data exchange between ISDN switches from two different equipment vendors.

A data call placed by a Digital Equipment Corp. Vaxmate trav-eled over local lines to U.S. West's Northern Telecom DMS 100 ISDN switch in Phoenix, then out to Western Union's interexchange network, then over to an NEC adjunct ISDN switch at a U.S. West Denver office and finally to an IBM Personal Com-

The data was transmitted in packet firm over the D channel of an ISDN Barre Pate Interface which defines two 64K hit/sec digital B channels for voice data or sideo transmissions, and a separate 16K bit/sec. D channel mgnaling and packet switched data. Data traveled via U.S. West's Digipac X.25 packet-switched network to Western Umon's interexchange Packet Switching Service

In comparison, ISDN site trials that U.S. West and other re gional Bell holding compa have initiated during the last few months only involved intra LATA communications via on vendor's central office ISDN

Phoenix ponders alternate PC bus standard

BY ED SCANNELL

NORWOOD, Mass. - Phoenix Technologies Ltd. said last week it is exploring the possibility of establishing an alternative 32bit bus extension to IBM's Personal Computer AT bus that is compatible with third-party add on boards.

Company officials said they believe the bus would receive enthusiastic support from board makers whose existing products cannot be used with the Intel Corp. 80286- and 80386-based systems in IBM's recently announced Personal System/2 senes. The new IBM systems emthe Micro Channel architecture. IBM's proprietary bus.

"IBM has put some high-vol-ume options on the Micro Channei - a lot of memory, graphics, disk controllers," said Rich Levandov, vice-president of stratemc operations for Phoenix Technologies. "The only thing thirdparty board makers can look at now is adding 4M-, 8M- and 16M-byte memory boards, and that is not a very high-volume business," he added.

Phoenix, however, is in a uandary about whether to clone "A" Basic I/O system of the PS/2 machines, which contains many of the systems' multitask ing and communications abili Levandov said Phoenix Technologies could produce an A-compatible product by Com-A-compatible product by Com-dex/Fall '87. However, the decision to do so depends on how much technological and market. ing sense such a move makes.

There is no reason to write directly to the A BIOS in a pro tected-mode operating system It violates the whole concept of protected mode," Levandov

"Program gets clobbered"
"If you have two programs vying for the computer's resources at the same time, and if one of them goes around the operating sys tem to the hardware, it is going to get clobbered," he added. "So I don't think A BIOS will be a factor in terms of compatibility Conving the Micro Channel

architecture would not represent a breakthrough in technology. Levandoy said, but it has its risks. One is the 100 or so nat ents IBM has applied for in con nection with the PS/2 series.

Phoenix said it will clone the BIOS of the IBM systems which allows IBM PC-DOS appli cations to run on the PS/2 series IBM has made some changes to the C BIOS that affect the way existing applications run under the PC-DOS 3 family. He said the changes are minor, however, and that he expects Phoenix Technologies will make a compatible product available

The alternative bus would also be welcomed by corporations that have a sizable investof which have traditionally prethird-party add-on boards, Levandov said Companies with 20,000 PCs have probably bought 10,000

third-party option boards, all of which are useless with IBM's Model 50 on up," Levandov said. Several MIS and micro managers of Fortune 1,000 compa-

nies interviewed last week confirmed Levandov's assertion, noting that add-on products of tion, a subsidiary of United third-party vendors are usually

We like the IBM computers. but we don't buy IBM boards be better ones," said Ron Goldfarb. manager of office automation for Pratt & Whitney Administra-Technologies Corp. "Instead of killing the clones. I think they [IBM] are trying to kill the Qua-drams and ASTs of the world." he added, referring to Quadram Corp and AST Research, Inc Phoenix first demonstrated an interest in developing an al-

ternative 32-bit bus in July 1986 when it beloed establish the Personal Computer Extended Technology (PCET) Standards Commillee.





or IBM, OS, VS1, MVS and MVS/XA

INNOVATION DATA PROCESSING

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Bank builds own distributed data base

Five years and \$1M later, Chemical Bank launches unit that links multiple data bases and host

BY ELISABETH HORWITT

While other companies wait for host software vendors to fulfill their promoes to deliver fully functional distributed system software. Chemical Bank has gone ahead and built a distributed system based on current data bases with the help of a software and consulting company.

Within the next two months bank's customer-comporepresentatives will start using the system to call up key custom. and account information across multiple data bases and hoots without having to do multinie lozons, download whole files or specify physical or logical to cations of data

first glance. Chemical Bank seems to have built its ha ac distributed system in record time Proposed in mid-1986, the initial system based on Automated Information Progression Inc.'s (AIP) Prism software, was up and running by January 30: currently, it is being tested by service-representative groups This near-miraculous turnaround is actually the colmnation of some five years and \$35 million to \$40 million worth of prepositioning systems devel opment efforts. The distributed system itself, including the user interface and applications sol ware, has already cost \$1 mil it will need to spend another \$1 milion to \$1.5 million before the project is complete.

Upper management appar ently does not grudge the price since distributed data base man-Rank s relationship bottong strategy. Leaders in the figancial and investment community currently are trying to form longterm relationships in which the provide customers with the full ing and deposit or just a credit

Payback to customers The payback offered to customers includes some more breaks. but normanic offers better we fact that service representatives are familiar with a customer's entire porttoho and financial his-In mid-1986, key series management people at Chemical Bank got towether and decided to customer service people's abilito deliver service "according to Bert Kulc. vice president in charge of the bank's card, rela tionship and customer-version

The group envisioned a onethat would enable any service representative at a terminal to ss the customer-account profile, provide financial details to support inquiries about any of perhaps most important, offer a complete history of all interactions between the bank and the

During that meeting Kulic omised upper management that he could deliver a distribut eight months. At the time, he adouts, he did not know precisely how he was going to accomplish this; but shortly after that he happened to meet Joseph Stadler, president of AIP, who was then working on another software project at Chemical

Found vital link

Kulti concluded that AIP's Prism software, which is currently distobuted by New Software Corn in North Attleboro, Mass., could help provide the vital link between the service representa tive and the bank's multiple data bases, which were - and still are - autonomous systems on different IBM 3090s m various hank other in New York New Jersey and Long Island. Even with the help of Prism

Kuhe's task would have been im possible if the bank had not be gun to tie its data bases together several years ago with a combination of internally developed and commercial products. Like many businesses, Chemical Bank founded its information systems on a series of disconnected data bases, each of which keeps track of a different function or type of account. Ower types we ended un with too many application systems and found ourselves dealing with a bunch of accounts er than with a customer,

Fortunately, the company began addressing this problem apbuilding a Customer Account System (CAS) that would manncomplete profiles that showed all the relationships be tween a customer and different accounts maintained at the back Two years are, the bank devel oped its Distributed Processing Interface Server (DPIS), which creates lugical nothways between disporate data bases and IBM's Multiple System Coupling product is used link IMS systems, while IBM's Inter Systems Communi-

By the end of last year, the hasystem had been set up and certificates of deposit and check-

ing accounts incorporated into profiles. Service people armed with a customer name or count number could call up CAS and trace relationships with all other accounts a customer has with the bank. Through DPIS, they could then access the data they needed. However, there was still a large piece miss. ing, according to Philip Russo. ace-president of 's Serroceline

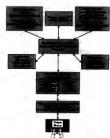
When a customer called ask-

cause each system already bad on-line components, and having users ask for data interactively across the existing communication links," Kuhe reports.

AIP's Prism software and the Integration Manage (DIM), which AIP created under contract to the bank forced links isting Chemical Bank data bases and applications. This saved Chemical Bank from the monu-

mental job of "converting three

Chemical Bank's distributed data bases rism software meshes with existing data base passigation and



ing about several different acoutts, service representatives had to log on and off for each different data base that held the key information. Additionally the representative had to know the rules for accessing each type through the system to get to the

We had individual systems that wouldn't talk to one anoth er," Kulic explains, "My job was to bring the data from all systems to one place so we could provide an integrated view to the service agents." Kultc's people considered several architecural approaches to the problem One wurkable -- but expensive possible solution was "taking relevant data from all system: and dumping it into one place eachday he ways This idea was

nihon lines of code," which many companies we as the insuperable obstacle to achieving a distributed data base system, according to AIP's Staffer Another advantage is that the

bank avoids the need to create tions data bases and the related necessity of finding some way to ate copies of data elements Our whole strategy is based on not having to duplicate financial

records." Kulsc notes Chemical Bank's distributed system combines existing software components, such as DPIS

and CAS, and three new elements. First, AIP's Prism soft ware provides a consistent set of menus and data views through which the agent interacts with the system Prom also tracks agents' work loads, recording when each customer request is filled - a feature Chemical Bank plans to use to better coordinate

The second new component DIM, routes data requests to the correct data base or region (see diagram). DIM is the guts of the distributed system since it allows the user to access as a ungle data view fields and records that may exect in different formed

and physical locations Third, One-Stop Customer Service contains internally written application software that generates MIS and marketing reports as well as record service transactions such as stons, warnmps referrals holds owerenand action items such as checkbook requests. One-Stop deterwhether a transaction should go immediately into the Chemical Cash Management System, which provides up-tothe-minute status on customer balances, bolds on checks and so on Less time-critical transactions are sent to a posting file that will be used to update data bases overnight.

Advantages

Russo, whose group is currently testing a prelimmary version of One-Stop, reports several ad vantages to the new system. We're getting to access information in a format we need based on the dynamics of a call system. We also know more about the customer while we're talking," he says. Under the old system, agents rarely knew a customer's full name during a call. Now, by entering an account number, the agent can call up the customer's profile including name, address, all accounts with the bank and history of contacts. "It's good to know that the customer called us yesterday about a specific issue," Russe compsents

Another advantage the sys tem will provide is consistency of data access. The Serviceline division is currently belong Kuhe's people design screens that can be used to look up informa tion on any type of account. And agents can call up the informa tion from multiple data bases without having to log on to each system separately and without ving to do their own navigat We nest stay in one system and let One-Stop do all the work. Russo says

Since One-Stop is still in the ouks ohase and will not be rolled out to all branches and selected departments until this year's fourth quarter, it is still too early to judge the system's potential Kulic explains. "The major payback is improved service to customers "he says

For Russo, whose group provides that service, the system promises, above all else, consistent quality: 'Just like McDonald's cheeseburgers taste same in California or in Paris. consistency of quality is imporrant in banking "Russo adds.

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thousands, of records at a time.

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□ Reason #5: High-Speed Relational Sort Facility Optimizes Data Aggregation

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Tandem to up distributed computing ante

Two low-end setems for outlying offices mark firm's first entry into Unix, CMOS fields

BY JEFFRY BEELER

CUPERTINO, Calif. - Tandem Computers. Inc. today is set to make its first foray into the Unix world and CMOS technology with the introduction of two low-end systems designed to bring distributed computing to sites where it was previous practical

More compact and priced tens of thou-sands of dollars less than Tandem's existing entry-level system, the CLX and LXN are intended for work groups and departsents in the outlying offices of major user

Tandem also announced the Javer-LX nenter compatible with the Hewlett-PackardCo Lasenet But through support of several of the industry's most popular interconnection standards, the CLX and LXN machines reportedly can be integrated with and extend the company's current network of

on-line transaction processing (OLTP)

32 users and three CPUs, with as much as 16M bytes of internal storage per machine. Using Transmission Control Protocol/internet Protocol, the system also ties IBM-style workstations and Tandem terminals together in an Ethernet local-area network and uses IBM's Systems Net

for its back-end connections. Available in four configurations, a fully expanded CMOS-based CLX incorporates six processors, holds 72M bytes of

The LXN runs Unix and supports up to

work Architecture (SNA) or CCITT X.25

main memory and executes 15 transac-tion/sec. For connections to IBM main frames and public networks, the machine supports SNA and X.25. Through the firm's Multilan interconnection product. the CLX links all Tandem Nonstoo family members to any local network conform ing to Microsoft Corp.'s MS-Net or IBM's

Federal Compress & Warehouse Co. has served as an LXN beta-test site for two months and reportedly plans to move the system into production on July 1

Installed in the 25 cotton-storage factlities that Federal Compress runs in the Mississippi River delta and Arizona, the LXNs collect data locally and relay key information about each incoming bala to the user's Memohis headquarters. After being processed centrally on the company's Tandem Nonstop II CPU, the data is returned to the remote warehouses in the

form of finished reports. Prior to installing their LXNs, the field locations were equipped with Mohawk Data Sciences Corn. Series 21s. which lacked the intelligence to initiate transmussions to and from the main office. Now, however, the sites can start their mications on demand and thus avoid processing delays that can prevent end users from receiving their data on according to Federal Compress Vice-President and Treasurer Bob Co-

Although the LXN supports Unix rati er than Tandem's proprietary Guardian operating system, the 32-bit machine is aimed as squarely at OLTP as any other

member of the vendor's CPU family Tandem's intent in embracing an in dustry-standard operating system is, at least partly, to gain entree into govern ment installations, auto makers and other environments in which Unix support is mandatory. "If you don't offer Unix, you can't even bid on contracts from those kinds of large organizations," said Terry Retford, the vendor's manager of processor and memory products

Technicians need not apply Unike the LXN, the CLX supp Guardian and is implemented in CMOS technology, which combines compara tively high component density with low heat dissipation. CMOS's inherent properties minimize the CLX's equipment fail ures and thus allow users to "assume in creased responsibility for their own maintenance," sard Tandem watcher Omri Serlin, head of Los Altos, Calif. based Itom International Co. "Virtually any defective board or other hardware component can be replaced without tools or service technicians," he added.

For now, the presence of CMOS com nonents makes the CLX technologically unitke Tandem's larger and more expen sive systems, which include the EXT, Nonston II, TXP and VLX, "But in the future, the company's plans call for it to make the parts in all its other systems in-terchangeable with the CLX's." Seriin

In single quantities, a minimum LXN with one 2M-byte processor costs \$23,700, compared with \$57,000 for a basic CLX with a 4M-byte CPU The 8 page/min Laser-LX costs

Although the LXN is available now, shipments of the first two CLX configurations and the Laser-I X are unlikely to begin until the second and third quarters, re-



systems

Tying with a single financial soft-ware system to meet the competing a ware system as more me company needs at two departments often comes down to a knock-down, drag-out provided Satisfying one group usually means compromising the needs of the imans compressing the most of the other in the end, neither group gets exactly what it wants Only Walker offers financial pack

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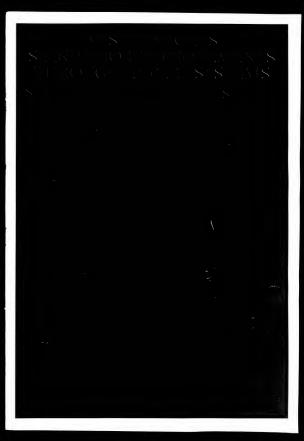
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Wang interlocks image and data processing

BY NINAMARY BUBA MAGINNIS

LOWELL, Mass. - Wang Laboratories, Inc. last week unveiled a VS-based integrated image processing system that can automatically store and retrieve images from microfilm, optical disks and magnet-

The Wang Integrated Image Systems (WIIS) combine image processing with data processing, office automation and communications capabilities, company spokesmen said. Also last week, Wang reported that third-quarter earnings exided the break-even point the firm had

WIIS configurations can start small and be expanded to larger, more expen sive configurations, including optical jukeboxes, as the users' needs expand, according to Wang. The systems include multiwindowing image workstations with a 16-m. diagonal 200 by 200 dot/in. betmapped monitor. Resolution is sufficient for reading fine print on insurance claims forms, and handwritten information ap-

pears smooth, without "stair-stepping. according to Wang. For many users, image processing is still too expensive to be practical, accord ing to Stephen Keese, a consultant in sys-

tems strategies for Boston-based John Hancock Mutual Life Insurance Co. The image workstation, for example, is listed at \$8.950

That's close to the cheapest that any of them have got, but it's still too expensive," observed Keese, who has evaluated image processing systems from the Rochester, N.Y.-based Eastman Kodak Co. and Costa Mesa, Calif. based Filenet Corp. as well as systems from Wang.

You have to have cheap terminals and \$8,000 is not cheap. The VS architecture is fine for distributing images, but without inexpensive image terminals, it's very expensive to start off with and also

very expensive to grow," Keese added The image processors are targeted at banks, insurance companies, medical in stitutions, law offices, corporate legal departments and accounting and investment firms. WilS will also be targeted at federal, state and local government agencies to track such unage information as personnel files, social services and welfare records, inquiry or request files and

legal case files, according to the vendor. Wang's image processing technology is based on its earlier product, the person al computer-based Professional Image Computer (PIC) that was released in Oc-tober 1983. The PIC was a product with out a job, noted Judith S. Hurwitz, news editor and consultant for the Boston based Patricia Seybold Office Computing

The vendor learned from its m noted company President Frederick A Wang. To rectify issues that were raised by PIC, the company formed a Product Advisory Council consisting of MIS man-



Frederick Wang

agers, Wang said. Council member David Jensen, director of computer services at Massachusetts General Hospital, said his computer

center is a non-Wang installation interested in a system that can streamline patient Initial cost justification of WIIS showed the system was too expensive to imple-ment, Jensen reported. Yet Wang im-

proved its technology to make the system less costly, he added. "I'm convinced Wang listened to users to understand customer needs," Jensen said. Although image workstations alone pport the windowing environment and

display images, standard VS workstations can perform document searches, copy the image from film or ontical storage to mag netic disk and print documents on host based laser printers, the vendor said. Larger WIIS configurations include an optical jukebox with a robotic arm that

moves platters from storage to the optical disk drive and Image Transfer Control lers that off-load device management from the VS computers and compress an ages coming from film-storage devices. Complete systems also include stand ne optical drives, scanners and cabinet-mounted optical drives

Systems start at \$100,000. Medium range configurations that support 10 us ers include a VS 65, a scanner and optical disk drives and range from \$250,000 to \$300,000. A 20-user high-end configuration based on a VS 7120 with 16M bytes of memory, printers and optical, magnetic and film-storage devices range in price from \$750,000 to \$1 million

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COMPLTER INVOCATION TO DOD of the sonType of expenses with what you are particular
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ETA preps

cess an additional 128 million words Each CPU cabinet is about 4 ft long, 2 high and 3 ft wide. The 800-MFLO CDC Cyber 205 now used by Florida State stands 7 ft high and is 17 ft long by and 10 ft wide. The Cyber 205 CPU use 8,500 chips, compared with 240 chips in the ETA-10

Florida State's system, being purchased under a U.S. Department of Energy (DOE) grant, is in place in the university's computing center - a building still receiving the finishing touches of construction crews. But the supercomputer remains under ETA Systems' control to the extent that ETA employees control access to the commeter room --- as it un-

uper market age 30% growth rate



dergoes debugging.

Despite any problems, Florida State officials remain enthusiastic about the system and its eventual official accep-

The ETA-10 was scheduled to arrive in lune, but it was brought in early when ETA Systems asked to use Florida State as a test site. That left ETA Systems with six months to prepare the machine for formal acceptance by the university

That six months will not be sufficient to test the machine out. We expect it will he close to a year before they get to where we can accept it," says Robert M. Johnson, Florida State vice-president of research and graduate studies. "They ran a job on March 26 and had some memory problems afterward. But it seems like it is progressing fairly well. They are just behand on the software, which is something

all yendors run into FTA Systems has run two more demonstration tests since that March 26 trial exercise, one for the DOE and one for

Florida State users A company spokesman said those tests wrally west well and that the "few gitches" that occurred were of the nature that could be expected, particularly where the tests were the first for ETA's

v operating system The ETA-10 will be the key system in Florida State's supercomputer center. which will serve scientists on campus and across the U.S. The center will house varyour technical systems in a healthing about two miles from the central campus. Those systems include the interim-host Cyber

205 now in leased space. Others include smaller CDC Cybers and two Harris Corp. iters. The center is funded largely by the DOF and the state of Florida, "I think a lot

of people are envious of what we have been able to do. Sure we would like more money: we'd all like to have more. But we have been able to provide a return on the investments with the development of the institute. We also wouldn't have the DOE contract without the state's help," John

The five-year DOE contract, signed in 1984, provided the university with \$44 mullion CDC and the state are each doest ing another \$1 million per year. The remainder of the \$63 milion, five-year budget will be covered by front-end charges

Johnson says the DOE grant was a model for other supercomputer centers. some of which received National Science Foundation grants two years ago. Rather that, the DOE donating equipment, Florida State equipped its center by the DOE paying access fees for 65% of the CPL ne on the Cyber 205, and later on the

The Cyber 205 cost \$12.3 million and is being traded in for \$6 million toward the \$12.9 million price of the ETA-10. DOE access is scheduled by DOE offi cials, who allocate CPU time for general, nonclassified research by various DOE (a-cilities throughout the U.S. The 35% of CPU time that is not used by the DOE is allocated by a committee of university ear-

entists The committee meets quarterly to review about 30 time requests from Florida State and other organizations. Those re quests come in the form of proposals by researchers who must explain the benefits of their work and justify use of a super-

Generally, we end up giving them some time, but it may be less than they asked for," says John W. Nail, deputy of the Office of Computer and Information Resources and a member of the commit-

Nall also oversees research and instruction systems including two CDC Cyber 730s, a Cyber 760 and the two

The systems are tied to several net-works, including the Florida Information Resources Network connecting all of DOE researchers access the supercor puter center through the DOE's Magnetic Fusion Energy Network. Other links in clude a network based on the U.S. Department of Defense's Arpanet and the State University Network

Center located in office park The supercomputer center, in a state-de

veloped office park on the outskirts of Tallahassee, is linked to the main campus via a 2.62-mile, 330-MHz communication line that will support 20 T1 circuits. The center was designed to support

the FTA-10 and several smaller systems and it will house offices for researchers The center was designed to keep the

ETA-10, printers, tape drives, communi-cations facilities and the ETA-10's operator console in separate but adjacent rooms. A room housing power supplies and cooling equipment adjoins the comnotes room

That cooling equipment is particularly portant to the ETA-10 because the su percomputer's circuits are in a metal tank containing liquid introgen, which is conrinually circulated and reconstituted to mountain the environment at below 326

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Al pendulum swings to general-purpose firms

BY ROSEMARY HAMILTON

When Gregory Richardson, a vice-president at a New York consulting firm, launched an artificial intelligence development effort last year, he chose to use a Sun Microsystems, Inc. work station instead of a dedicated Al-

Richardson is one of a grow ing number of users causing a mor shift in the Al market These users are turning toward general-purpose computer vendors for lower cost AI systems that can be integrated with general-purpose systems.

Earlier this month Lish Machine, Inc. declared bankruptcy. Symbolics, Inc., the AI systems market leader by a wide margin. has notched two consecutive los ing quarters in its current fiscal off nearly 20% of its work force.

Meanwhile Sun Microsysclaims that 6% of its \$210 1 million in 1986 revenue came from AI-related sales

The emerging capabilities of on a general-nurnose workstation have become very acceptable," says Wilham Wise. vice-president of marketing at 1 so Machine

A number of factors have come into play during the last Iwo years that have caused the shift. In the early 1980s, dediitem. Selling primarily into research and government man kets, Symbolics was able to pass the \$100 million revenue mark

Users in these markets, insived with advanced and experimental AI work, were willing to shell out the typical \$100,000 price for a system

'It was easy in the early day: They [general-purpose computer vendors] were growing at more than 50% a year. They thought everybody wanted a LISP machine, but that wasn't true," says Harvey Newquist, editor of "Al Trends," a newseditor of "Al Trends." a news-letter published by DM Data in Scottsdale, Ariz But as more

rs pursued Al development plans and as more Al development software became available for general-purpose systems the heady days for the dedicated systems yendors came to an end And as more AI applications were developed, the need for

low-cost systems to run these applications increased. Users generally did not want a high performance system that of \$60,000 or more to run an Al ap plication. General-purpose vendors were better able to provide these systems, known as delivery systems to contrast them with development systems.

Richardson, vice-president of product development at Perfor

mance Evaluation Resources Inc., is developing an expert system that would assist in pension fund management. He uses the Sun-3/160 workstation running Common LISP from Lucid, Inc

velopment system," he says. 'At some point, we might want to distribute this system to our regional offices. Symbolics We're in a start-up situation, so we don't have the staff, the financial resources or the time

didn't have a good delivery vehicle," Richardson adds. Industry analysts say they expect to see vendors like Sun.

Al market, while companies like Symbolics will become rische players by offering high-performance development systems

ontinue to gain strength in the However, Symbolics Chair-man Russell Noftsker does not see things that way. He acknowl-

edges the market shift him attributes the quarterly losses to duction last year that cut back demand while users waited for

the new systems. Furthermore, he says Sym-

bolics can provide both development and delivery systems — it has a \$40,000 low-end product - and does not plan on becom ing a specialized company.



Uccel heeds users, will continue ADC2 support

BY JAMES A. MARTIN

INDIANAPOLIS - Backing down in the face of considerable heat from users. Uccel Corn. has reversed its decision to withdraw support for the popular ADC2 mainframe scheduling

At a recent meeting attended by some 40 users of Automated Data Center Job Scheduling and Producton Control (ADC2), Uccel said it will continue to sup port ADC2 Version 2.3.0, the most recent release, indefinitely

ous release. Version 2.0, will be supported until the end of this year. Uccel had ongunally an nounced support for Version 2.0 only through March. The meeting was arranged by ADC2 users in response to Uc

market immediately and would discontinue supporting Version 2.3.0 in December 1988, ADC2 was formerly a product of The Cambridge Systems Group Inc. which Uccel acquired in Decem-

In its February notice to

ADC2 users, Uccel said it was discontinuing ADC2 in favor of its own UCC-7 because it was at feasible to support two IBM MVS environment schedulers Uccel had offered ADC2 users the chance to convert to UCC 7's basic package at no cost and to the LCC-7 full-function package for \$7,500 [CW, March 9] In addition, Uccel originally

said it would offer two free seats to each corporate ADC2 user at a regional UCC-7 training session and gave ADC2 users until April 30 to decide whether they wanted to take advantage of the conversion program. ADC2 users found them-

selves suddenly pressured not only to decide whether they wanted to switch to UCC-7 but to choose among various other competing, vet similar, schedul ing packages. Vendors such as Southwest Software Services. Inc. and Bennett Software, Inc. made special offers available to entice disgruntled ADC2 users to their own software packages. ICW March 230

In an effort to encourage conver-

sion to UCC-7. Uccel said users will not have to attend regional training seminars and will now be provided with two days of on site technical assistance for the conversion at no cost other than travel expenses, as cording to Craig Stall, Uccel's

vice-president of marketing Uccel has also developed an automated conversion program to assist ADC2 users in converting to UCC-7. Stall said. program that will read the ADC2 data base, analyze it and load the UCC-7 data base with 60% to

90% of the information it needs to do the scheduling in UCC-7 participate in the ADC2 users group meeting to discuss users problems, Stall said. "Our intention was to put together a pro gram that best met the needs of

the users, and we think there will be universal appeal for this offerhe added the meeting. "took a fair amount of negative criticism, subse quently made a conference call back to Uccel and, half an hour later, came back to announce the concessions and changes in their

policy," said Robert Marsh, a supercent for the computer ser vices department at Dow Cor rung Corp. in Midland, Mich After Uccel announced

suld discontinue support for ADC2. Dow Corning users were faced with having to convert to - and train for - another scheduling system. "Anything we considered changing to was going to provide less than what we have now, 'Marsh said. Support for ADC2 will ever

tually be phased out, according to Stall, but only after the pack age's some 130 users have con

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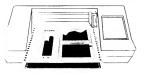
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\$150,000.

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In Information Technology Integrato

Face-lift aim to get Multimate back in race

BY DAVID BRIGHT

TORRANCE, Calif. - Answering users' demands. Ashton-Tate announced last week that it has added document orientation and several other improvements to its Multimate Advantage word processing package for the IBM Personal Computer.

The page-oriented Multimate was once one of the most popular word processing lines but cently has been surpassed by document-oriented programs such as Wordperfect Corp.'s Wordperfect and Microsoft

Corp.'s Word.
The rejuvenated Multimate Advantage II package was de signed for the new class of mans gerial and professional users who need faster, easier to use software Marketing Vice-Presi-

Xerox adds to publishing system line

BY ALAN J. RYAN

ROCHESTER, N.Y. - Xerox Corp. added four models last week to its Xerox Desktop Publishing Systems (XDPS) line for users who already own laser or ink-jet printers

The addition follows a February announcement in which Xerox introduced the seven-system XDPS line. The latest configurations were not announced in February, company spokesman Daniel Minchen said, because the pricing for systems without printers had not been set.

Minchen said the new configurations were created because a corporation or individual may have existing printers in place and may not need that compo nent to make it into a desktop publishing system

Analysts called the new mod-"practical." "It's always wise els "practical." marketing not to force people to buy a peripheral they already said Joe Cross of Future Computing/Datapro in Dallas. Included in the systems, which are available now, is Re-

lease 1.1 of the Xerox Ventura Publisher Edition software. which reportedly offers 80 new

Also included are a Xerox personal computer or 6068 PC-based word processor with a 20M-byte rigid disk drive and 640K bytes of internal memory: full- or partial-mage monochrome or color display and operating system software. Prices rance from \$4.595 to \$6.095

class accounts for nearly half of Multimate's 500,000 users, she said. Multimate's traditional customer base consists of secretarial and administrative workers. The \$565 package offers us-

page-by-page basis. Other fea-tures include an optional pulldown menu interface consistent with those in the company's Dhase III Plus, Framework II and Rapidfile packages; the abiliers the choice of moving through ty to merge files with Dbase files continuous Undo function for recovering erased text, and the ability to handle a greater num ber of fonts for laser printers. According to Ashton-Tate, the package is faster than previous versions in several areas: pageto-page scrolling, sending output to laser printers, searching and replacing and spell checking

Ungrades from any version of Multimate are available for \$100. Multimate Advantage II is also available on 312-in floory disks for operation on IBM's new Personal System/2. A Premium Park with both 51st and 31sten disks is priced at \$595. The package is available now



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EDITORIAL Moving ahead

he federal government has long been a favorite target for critics of bureaucracy and waste. It is therefore refreshing to see a federal agency take the lead in reducing the amount the government spends on computer systems.

The U.S. General Services Administration (GSA), in rare cooperation with the Reagan administration and the Office of Management and Budget, has taken steps in the last year to drastically pare down the government's long lead time for acquiring computers. Under the newest GSA policy, the agency will designate a single manager to shepherd computer purchases. The policy follows on the GSA's "Go for 12" program, announced in September 1986, that seeks to cut the time required to buy major systems from a three-year average to 12 months. Few organizations are in greater need of renairing their computer buying policies than the government, whose systems are, on average, twice as old as those in Fortune 500 firms. It is ironic that systems that affect so many can be, in the words of GSA Administrator Terence C. Golden, "already one generation behind by the time [they land) in our computer room

It is still too early to assess whether the new GSA initiatives will work; results from the "Go for 12" program aren't due for more than a year, and previous GSA programs have been disappointing. But it is heartening to see the administration, the GSA and federal agencies cooperating in an area that touches so many people.

Saluting glasnost

ecent sounds emanating from Rye Brook, N.Y., indicate that the spirit of glasnost - the trendy new Russian term for openness - is not limited to the Soviet Union, IBM, long regarded by analysts and the press as Fort Knox when it comes to public information, appears to be cracking open its doors a bit and offering the world a glimpse of its mótives and intentions.

In recent weeks, reporters have had an easier time reaching IBM's public relations staff. And those representatives, whose efforts to limit information flow have reached almost comic proportions in the past, have become noticeably more helpful. Top executives are making themselves available for interviews. Responses to reporters' technical questions have been more forthcoming. Phone calls are returned quickly and often contain relevant information rather than the traditional IBM refusal to comment.

We applaud IBM's new, more cooperative attitude toward those who disseminate and ana lyze information about the company. Such openness ultimately benefits the reader by preventing errors and speculation from finding their way into print and by enabling information providers to spend more time interpreting the facts and less time searching for them.



Your publication and others have featured articles and reviews of performance of personal comnuters and PC clones. Unfortunately, in most cases the reader has not been informed about the required Federal Communica-

tions Commission certification for the sale and use of PCs and Many advertisements claim FCC approval, which is meaning-

less for computing devices. Class B computing devices are those computers and peripherals that are marketed for use in a residental environment. They must FCC radio-frequency emission Inutations and have an FCC identification number visible on the externer of the dayses at the tame of sale

Noncertified computers fre quently cause interference to telession and radio recention at tion, the same conditions that all low radio-frequency emissions to escape the computer will also allow strong radio signals from nearby transmitters to interfere with the consputer's operation The FCC has been conducting

a vinorous enforcement compagen for more than a year and has issued fines totaling severa hundred thousand dollars to those who manufacture assemble, advertise or offer to sell or lease, ship, distribute nr use uncertified personal commuters. Those who purchase and use uncertified computers at home are at risk. In addition, those users who cause harmful interference to television or radio recention by the use of a certified commuter must cease use immediately until the interference is stonged Anyone with 300 or 1,200 certification status of any pe onal computer by using the FCC In regard to William Inmon's ar Public Access Link (PAL) by call Denormalize for efficiening (301) 725-1072. This sercy" [CW, March 16], many arguvice allows direct access to the FCC data base. It is user friendly

ments can be made for not denormalizing data. One is that a and menu driven. One enters the denormalized data structure FCC identification number for may result in poorer system perthe computing device in question formance due to the longer reand is informed about the certific ord length of each table entry. cation status of that model. Each Modern computer systems gen-erally read "blocks" of data with access is limited to five minutes to moure maximum availability each disk access. Each block contains a minimum of one record

but generally many more For example a 512-byte block can contain four 128-byte records but only one 300-byte record. Adding extraneous information to a normalized record may have the opposite of the mitended effect and increase the number of disk I/Os necessary to implete a transaction due to a decrease in the number of records per block

In the author's example the supplier's name, address and phone would likely be dead weight when accessing partnumber information for the printing of packing slips and in-When one adds the costs of additional storage, increased

coffuere maintenance time a decrease in the suitability of the data structure for fourth-generatinn language programming and a great increase in the difficulty of testing and auditing, the decision to denormalize a data structure appears a poor choice among the many alternative means for achieving greater sys-

tem performance. feel Martin Director Development Computing Serences Harvard University Cambridge, Mass.

LETTERS TO THE EDITOR **FCC** certification Denormalize or not ht/sec modems may verify the

J. J. Freeman National Coordinator Computer Marketing Enforcement FCC Vergensa Beach, Va

This week in history April 18, 1977 Mentally and physically

to other users.

handicapped preschoolers bying near Lexington, Ky., are learning by playing with common toys converted to com noter terminals. The toys are the typical department store variety - clown-faced boxes multicolored kick panels and "busy boxes" — that are dectromially modified by the University of Kentucky's Department of Special Educa

April 19, 1982 Tracy Kadder is awarded the Pulitzer Prize for general nonfiction for his book The Soul of a New Machine. The book chromoles the development of Data General Corp.'s MV-8000 32-bit supermini code-named "The Eagle.

COMPUTERWORLD

stem-numbering systems had

been created centrally and re-

porting frequency was mandat-

ed, so central management ex-

pected uniform reports from

locally created processing sys-

tems. Nevertheless, one site re-

tions than the others, even

though management received an

abnormal number of complaints

ported fewer out-of-stock condu

Fostering a green-eyed monster | The slow stuttering

green-eyeshade functions all

file-based systems are likely to become useless because of in-

consistency and inaccuracy

Here are two examples of file

based systems created careless-

verse drug reactions. Doctors

Example A is a system devel-

FREDERIC WITHINGTON We sympathize with Bob Cratchit in Dickens Christmas Carol" because Scroope

was mean to him and because he loved Timy (sol/1 Tim. But we do not sympathize oped to collect reports of adwith Bob Cratchit, the systems professional. Shivening on his sent their reports to a governstool all day long, making obscure entries, he symbolizes the 'ercen-eyeshade mentality' formal, mt-nicky, often irrele-

vant to management's needs for But think of the function Cratchit performed, expressed in modern systems pirgon: 1. He was a data archi-

tect. We don't know whether Cratchit defined the chart of accounts for Scrooge & Marley, but clearly he handled changes and exceptions without direct

2. He provided a data dictionary. He assigned all transaction descriptors personally 3. He used a fault-resis tant data entry system. Dog ble-entry bookkeeping provides virtually complete protection

against single errors of either arithmetic or classification 4. He provided a flexible interface to the data have The entries were visible in Ara bic numerals and the Roman alphabet, and Cratchit was always

tomerpret. Without someone or some A 30-year veterag of the computer in dustry, Withington was a vice-president codemondant consultant. He has sentten four books and more than 60 articles.

would provide undormity. But the reports varied so such that the computer could of Arthur D. Lattle, Inc. and as now an

the facts, could produce useful results.

ment processing center for anal

vsis It was hoped that using

standard medical terminology

backed up by a synonym dictio-

nary in the main committee

make clear correlations Only human analysts, deriving suspicions from the forms and calling the ongunators to verify Example B is a decentralized

had taken advantage of due dates. When an out-of-stock stem was ordered, their system would compare the date the item was wanted with all the open reorders to see whether any new stock might arrive in time. If it might the sate did not see itself out of stock. If the stock failed to arrive in time, however, the ordering party, without warning Continued on page 22

Investigation revealed that

about its performance

of the LISP industry

HARVEY NEWQUIST LISP is a hard word to you Say it fast enough in sequence and you start haping. LISP 15

guage in which a large num ber of Al industry people always wrote their annheatings, 1 ISP is great for graphics, expert systems, computer-aided design

Then why are the machines that best run this language getting beaten by general-purp computers from vendors such as Digital Equipment Corp. and Sun Microsystems, Inc.? The primary example: Lisp Machine, Inc. filed for protection under Chapter 11 of the U.S. Bankruptcy Code this month after scaking up \$35 million of its investors' mon ey since 1980.

LISP machines were first conjured up in MIT labs in the early 1970s. They were designed to run the programming language LISP, which was in-vented in 1956 by Professor John McCarthy, comer of the term "artificial intelligence

LISP, which stands for List rocessing, is one of the two or the system designers at that site three oldest languages in the computer world. It utilizes symbols instead of numeric representations to run programs. There is a drawback. LISE uses an incredible number of no rentheses to make its groupings

> val entrilizence and other advanced high technology topics from his office in

Lots of Inane, Stuped Parenthe Also, all the associations objects and symbols use up enough memory to bring an IBM 4300 to its knees. So LISP me those were created solely to run LISP code With LISP muchines the world's research community had a device that could efficiently run expert avatema do rapid software prototyping and mfty graphics But these machines weren't sold to the open market because there wasn't one -- re search and development people vere the only users... Corp. had a chance to make the

1 ISO markone, but we market and staff couldn't figure out what to do with it. Perhaps the machines' names. Dandelson and rtiger, weren't much help. In 1980, a group of research ers left MIT to form Symbolics loc and manufacture and man ket deducted 1150 machine Another MIT group left to form Lisp Machine, which was going

first commercial splash with a

to focus on multiuser LISP ma chines. Both companies faced an initial obstacle: No one in the commercial computing market place had ever brand of LISP let alone needed a machine to run it So Symbolics and Lisp Machine hit the market selling powerful machines that no one had a clus what to do with

But sell they did Symbolic must be given credit for creating an entire market General Mo tors Corp , the U.S. Department of Defense, the National Aero

nautics and Space Administra Continued on bary 22

DCA members just want to have fun

JEFFRY BEELER In their long, black robes and

powdered wigs, the two judges look every bit the part of the stereotypical British jurist. Even the charges sound genuine The defendants stand accused of convent infringement." the magistrate proclaims with mock

But wast a minute. What, pray tell, is that guy who calls himself the Devil's Advocate - the one prancing around in a red demon costume and brandishing a rub ber pachfork - doing in the of a judicial proceeding? What kind of court pillones its accused to change of Styrofnem fashioned in the shape of stocks: And would someone please

Berlier is a Combuleranteld West Coast correspondent.

explain why dozens of spectators of this exercise in fractured justice are pelting the immobile defendants with corks? Clearly, this is no ordinary tri-

at But then again the aggregated party in the case is no ordinary htigant. Whatever else it may be. no one could ever accuse the Digital Computer Association (DCA) of being just another professional society

Conformity and solemnity Virtually alone among trade organizations, the DCA embodies the spirit of rebellion against the stuffy conformity and tiresome solemnity that the computer industry's intense competition and technological ferment so often

breed. Through its pranks and parodies, the DCA labors to preserve one of the computing field's most neglected and en

dangered aspects — its sense of

Just how serrously the associdy was demonstrated in snades

during its March annual meeting in Los Angeles. The main event featured a mock trial that would sent Onver Wandall Holmes into a state of catatonic ohov k Though into the relieve set role

of defendant was the newly formed International Person hood of literate [ssc] Programmers (IPIP), an equally uncon DCA charged in absentix with the specious crime of copying its proprietary looniness

Cherished traditions Systems folk would have a duticult time finding another professional association that calls its presidents "Fish" or welcomes first-time visitors to its meetings with less made of paper toilet

Nor so the members of most other trade organizations routinely disrupt their get-togethers by tossing corks at each other, a practice DCA members rank among their most cherished traditions.

Aside from its fondness for archy, the group's most distin guishing trait is its longevity. Beheved to be among the industry's nidest societies of any kind, the association perpetrated its first act of unabashed facetionsness in

Even way back then, the DCA's founding fathers recog nuted the need to counter the computing field's tendency to take itself far too semously. So, one score and 15 years ago, they brought forth in this industry a new association, conceived in levity and dedicated to the prop osition that no cow is too sacred

nulk for laughs In blending one part James

Martin with 10 parts Steve Mai in, the association has regularly and cheerfully demolished deco rum, deltly skewered pompos ity disdained convention, 680; nurtured lunacy, according to ex-Fish Mary Rich Today, the association boasts

nembership of approximately 100 computing specialists A sampling of this fellowship of cludes Rich who was the chair of Conference: Linda Taylor, presi deat of her own systems engi ering and management firm Robert Rector, vice-president of Conference and Meeting Assis tance Corp., and independent consultant Herb Growth In their non-DCA conscious

most of the members are models of sober professionalism and realthnugh spectability. would no doubt vehemently deny such a serious accusation

LISP industry

and even IBM are a few that saw the potential for specialized applications. By 1986, Symbolics had racked up sales of \$114 million and installed more than 2,500 machines, ranging in cost from \$50,000 to \$125,000.

Symbolics was perceived to be the techonology leader. Lisp Machine flower there wasn't as much of a demand for its machines as expected. It lost market share to Texas Instruments, Inc., which also happened to be one of its first awestors. TI saw a market for LISP machines and figured it could afford to lose its 2520,000 investment in Lisp Machine if it

could gam sales at its expense. It did-Then came the summer of 1986. A lot of users were concerned with the high price of LISP machines and started running applications on more economical delivery vehicles, like IBM Personal Comnuter ATs and Sun workstations. Sure there was a performance differential, but the trade-off was worth it. Why buy a Symbolics 3600 when you could get ti Sun computers for the same price? The Al consulting firm DM Data estimated that by the end of 1986, there were more than 6,000 LISP machines installed worldwide — more than a third of them from Symbolics, However, DM Data also estimated that there were probably fewer than 6,000 LISP programmers qualified

That means there are LISP machines satting in companies with nothing to do.

By the end of 1986, specialized LISP machine sales ground to a screeching halt.

Companies hadn't really stopped spending it in new tons, they were just spending it in new

tonis, they were just a planting in an applices, the art 5 min and Apolio. Symbolics was looning mooney going into 1987. Lisp Machine faced Capter 11. Both companies moved to smaller offices, Symbolics, once thought invaluerable, lad off 17% of its work force. Lisp Machine worked out a deal with credible, the meantime, both T1 and Aerox shifted attention to LISP chape. T1 anounced its LISP chap twice.— first in Machine 1981, and the community and then

community. Symbolics is now going after Sun and Apollo in their own markets. There are even newspaper ads that talk about the machine's versatility in multifunction environments and how the performance and price now make it a great general-purpose workstation.

general purpose werestaten. The changing face of the market does not mean that no one is using LISP machines for LISP programming anymore. But the demand for speculized machines actually grows a fest as it once did samply because there are not enough newly trained people to run them efficiently. The lesson is a simple one, and one that

The lesson is a simple one, and one that has applied to all specialized machines since the idea of selling was invented: What happens when everyone who needs one, wants one or can afford one has one?



received no shipment.
Murphy's Law suggests that troubles

his these develop in any system unless someone locks out for the following:

Data definitions: their nature and relationships and the control and promulgation of changes in them.

File integrity: the timeliness, accuracy and consistency of data entry.

The access metrices with other systems and controls of privacy and mission. A degree of speculaired system knowledge is needed to perform these functions, both at the time of file creation and later, and end uners aren't very interested in providing it. Intexperienced end users often feel that somehow them systems will work well without green-eyelabde-

later, and end users aren't very interested in providing it. Inexperienced end users often feel that somehow their systems will work well without green-eyestadetype discipline. Once convinced of the need, however, end users will often let central MIS provide related imputs to their system designs. (The last thing end users want to claim is green-eyeshade expertise.)

Maybe the answer is an artificial Bob

cratchit — a rule-based file access and control system that provides the necessary green-eyeshade functions in systems that are completely end user operated. Specialized versions of these have existed for years in dedicated on-line systems.

for years in deficated on-line systems. The most successful on-line systems usually have been designed cooperatively be end users and central MS. Also, some of the fourth-generation application development systems force some gree-cyclade behavior on end users in a palatable way. Natural selection is likely to encourage these systems' evolution.

In any case, it's up to the corporate information systems — whether auditors, systems analysts or information resource managers — to make sure end users incorporate the necessary degree of greencystude mentality in their systems. That's not very difficult to do because

the need is obvious (Scrooge continued to employ Cratchia), but end users tend to overlook the subject because it is unwelcome. If relationships are what they should be, end users will expose their systems ideas to MIS while they're still un the formative stage, and green-eyeshade issues can be addressed early.

They will do so for three reasons: 1) they know from training courses that controls are needed; 2) they trust central MIS to help, not hinder; and 3) the organization's IRM policies require them to.

How are relationships in your organization



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SOFTWARE & SERVICES



Richard Finkelstein

Judge SQL via standards

Now that Structured Query Language, better known as SQL has emerged as the data base language standard, vendors are racing to introduce products that connect or interface with SQL. In the mad dash, the term 'SQL" is in danger of becoming misused as "relational" and

Fortunately, in this case there are two standards available: IBM's and the American National Standards Institute's (ANSI). Although the standards differ in some ways, they are reasonably close and can serve as a means to verify the

impleteness of a vendor's SQL implementation SOIL consists of a data ma pulation language, a data defination language and a data con-trol language. They can be executed directly or embedded in an application development language. Data manipulation age commands include SE-LECT, UPDATE and DE-LETE. All commands should have nested overy canabilities or subselects. Subselects allow the results of one query to be used within a higher level over Continued on page 30

Vendors see VM market change ADR links the 9370 -- will be paying less

BY ROSEMARY HAMILTON

Since the late 1970s, a number of small system-software ver dors have made modest but steady incomes by providing util-ities that plugged holes IBM left in its VM operating system. Now IBM is changing the rules on

As IBM continues to enhance VM while also positioning it as the key operating system for the 9370, the independent vendors have been forced to implement changes in both pricing and prod-

uct strategies A number of these vendors say they will institute tiered oncing for their software products to coincide with the graduated pricing scheme introduced by IBM last fall

The vendors have little ice, since users of low-end IBM 370 machines - namely Data View Installed base grows

for DEC's All-in-1 Acceptance of this package, which includes word process-ing, spreadsheet, calendar,

per, is helping sell VAXs.

4000 LICENSES SOLD

for the VM operating system and many associated IBM products than high-end users.

Consequently, users will likely

show little interest in products from independent vendors that carry an IBM 3090-class price for a low-end system

VM Software, Inc. in Reston Va., says plans are under way to implement a graduated pricing

In addition VM Contame Group, Inc. in Arlington, Va. which implemented a three tiered pricing plan last year reports that it will soon an

nounce a four-tiered plan to bet ter reflect IBM's policy. "I wouldn't say we were driv en by IBM, but they certainly took the lead," comments Robert Cook, who is chairman of VM Software, in reference to the

Meanwhile, Adesse Corp. Danbury, Conn., has held off an nouncing new prices, though it will likely do so, according to Tom Foth, vice-president of research and development

Keeping price in line If a user spends \$30,000 on a

processor, we can't charge the same for software. System Resource Manager la utility program for VM/SP that helps users allocate system resources | costs \$60,000, almost tween the cost of the processor. How could we possibly charge that amount to 9370 users?" Foth asks.

VM Software, for exa currently offers a line of utilities, such as VMSort, VMSecure and VMAccount, that sell for approximately \$10,000 each. VMCenter which is a package of 14 different utilities, sells at Continued on page 27

E-mail to Disoss

BY CHARLES BABCOCK

PRINCETON, N.J. - An interface between an electronic-mai system and IBM's Distributed Office Support System (Disess) was announced last week by Applied Data Research, Inc. (ADR) Users of ADR/Email Release 3.0 and the optional interface can store and retneve docu-

ments in a Disoss library, using keyword search and logic condtions. Outgoing or incoming cor respondence is put in IBM's Document Content Architecture 'final form." ensuring that transmitted information is pre sented correctly, spokesmen for

Release 3.0 also provides ectronic-mail capabilities to the IBM Personal Services applications series including versions that run on the System/36 and 38 mid-range processors

ADR/Email users com cate with Disoss users as if the latter also were on the ADR/E mail system. A message may be sent simply by keying in the re-Continued on page 28

 Risk analysis service aimi to protect buyers. Page 28.

Boole & Babbage updates IMF 2.3.0. Page 31 • Jeyco Software rolls out

VM/VSE performance tool. Page 32.

OA tool reflects work flow

Unix-based system emphasizes intergroup use

BY CHARLES BABCOCK

OTTAWA - An office automa tion system that provides inno vative document creation and retrieval features tied to electrofic most as available from Xios Sus. tems Corp.

The firm based here, spent five years studying office work patterns and developing a sys tem that reflects a multilavered work flow. The result is an office system that can be used to a num-

sages across a variety hardware systems, said Brian E enleaf, president of Xios. Renassance, as the office system is called, is a Unix-based system running on AT&T 3B, Linuxys Corn. (Sperry Corn.) vergent Technologies.

er applications or exchange mes-

5090, NCR Corp. Tower or Con Mightyframe processors. At the Government Research Corp., a public-policy consulting firm in Washington, D.C., 30 users on Wyse Technology terminals are

ment creation and editing prod

act from little-known Network

Technologies International.

Inc. of Ann Arbor, Mich., is be-

ing co-marketed by AT&T. The

Document Exchange, an

nounced recently for document

Digital Equipment Corp. has

signed a cooperative marketing

across multivendor systems.

conjunction with AT&T's

Unix-based package will be u

Data General adopts Ingres into its MV family

Data General Corp. will make the Ingres relational data base management system available on its MV family of 32-bit processors and DS/7500 engineerworkstations under its AOS/VS operating system. Other Relational Technology Inc products will also become available on the MV family, DG

The problem of extracting mainframe data for use in commercial expert systems is being addressed by a joint development program undertaken by Unisys Corp. and Sterling Software. Inc.'s Answer Systems Drysoon. The project will seek to

take the Answer/DB micro-tomainframe link and develop a data extract and transfer capa bility for Unisys products that in-terface to IBM's IMS, VSAM and DB2 data have management

stems Division has signed a development agreement with Wang Laboratories. at integrating Wang's Pace application development

and relational data base product for VS processors with Ans-Such a move would open up DB2, IMS and VSAM files on a mainframe to a VS imputer. Wang spokesmen IBM has beensed Micro Focus Cobol for the IBM Personal System/2 Dubbed IBM Cohol/2 at a available immediately for use with IBM PC-DOS 3-2 and 3.3 and will support OS/2 when it becomes generally avail IBM CoboV2 meets the ANSI Cobol '85 standard, Micro Focus Chairman Paul O'Grady

Dun & Bradstreet has myested an undisclosed amount with Atlanta-based developer

Sales Technologies, Inc., an narketer of networked software for sales organizations

agreement with Henco Soft ware, Inc. to co-market Henco's Info-DB Plus relational data base and text management extento the legal industry Docuforum a maltuser ducu-On-Line Software Interna-COMPUTERWORLD

tional, Inc. of Fort Lee NJ. has formed a Toronto branch named On-Line Software Canada. Inc. The firm was in operation as the Mathematica Products Group Canada marketed Martin Marietta Data Systems products. On Line as quired the Ramis Information System, Ramis PC Workstation and UKFO Productions System from Marrin Manetta

Data Language Corp. of Billerica, Mass., has signed a joint marketing agreement with Altos Computer Systems and Arete Systems Corp. Data Language spokesmen said. Altos manufactures supermicros, and Arete designs on-line commer

APRIL 20. 1987

snokesmen sand

OA tool

CONTINUED FROM PAGE 25

connected to two Mightyframe processors sharing documents and exchanging messages with each other and corporate offices, said Julie Romero, director of ad-

Although Renaissance can function as stand-alone system that supports 25 to 35 users connected by twisted-pair wir ing, system processors may also be tied together via Ethernet or other local-area networks, permitting intergroup commu-

Users praised the simplicity of Renaistains both individual and office or shared naissance user since July 1986. "It's like

files, and users may retrieve files by falling off a log," added Jim Wolfe, a direcsearching for any number of fields used in tor of New Venture Development Corp. the specific design of the document. For in Washington, D.C., and a Renaissance example, the user can search for a document on the basis of

filename, subject, date or creoptions works, other searches can be conducted. The name of the last party to modify a document can lead a search or key phrases or parts of phrases that are known to be in the document

It's such a simple, simple

system that you wonder what

er user by typing the name of the recipient along with the command SEND. Renais-

sance taps a directory of us ers to automatically route the message. Romero said docuyou did without it." said Romero, a Re- back down to Washington with executive ments in minutes

user for two months.

The system can maintain distribution to a group without entering the name of

Users may create tickler Documents to be transferred may infiles, seeking automatic reclude images and voice data as well as minders of action needed on particular documents on a

Renaissance has a background feature that automatically stores files every 15 seconds, minimizing data loss in case of The system also has a simple word proressor, termed a text editor. More sophisticated word processing needs are

met on standard word processing workstations or IBM Personal Computer word processing packages, with files trans-

Lacks spreadsheets

Users said the system does not offer spreadsheet capabilities but that files may be transferred into Renaissance from Lo tus Development Corp.'s 1-2-3 and other packages based on Microsoft Corp.'s MS-

Renaissance was designed to connect to other systems by following such interconnect standards as the American tional Standards Institute's x3.64; IBM's Systems Network Architecture, Document Content Architecture, Document Interchange Architecture and 3278 ter-Standards Organization's communications protocols. Renaissance is sold as part of a turnkey, hardware-software system at a price of \$2,500 to \$3,000 per user Greenleaf said

Tool tests MVS. VS1 application program output

GARDEN CITY, N.Y. - A testing tool has recently been upgraded and now has the ability to check output in files, records and fields after a program has been modified and to pinpoint mismatches in easy Release 1.1 of Computer Associates

International, Inc.'s CA-Accucheck is designed to simply the programmer-intensive task of testing and maintaining appli-cation programs in the IBM MVS and OS/VS1 environments, according to spokesmen for Computer Associates. Release 1.1 also is said to contain the

ability to "dump" records, printing either selected fields or full records in either The tool can create test files and process VSAM and Indexed Secuential Ac-

cess Method files, according to the ven-These features are said to reduce the

mber of test runs needed Release 1.1's ability to test an entire job stream and pinpoint exceptions speeds the removal of bugs from applications. Computer Associates snokesmen

The \$8,000 product is also marketed as part of CA-Convertor, a VSE-to-MVS Computer Associates, which is head-

quartered in Garden City, markets more than 70 system software products for the major IBM operating system environ-

Bridge makes the only complete for TCP/IP Communications servers, gateways, bridges. PC interfaces and network control servers, over broadband (5M bps) and Ethernet (TERE 802.3) All the tools you'll need to make incompatible equipment compatible For data sheets and more information. call (415) 969 4400 Communications. that build companies

Vendors see CONTINUED FROM PAGE 25

a proce of \$45,000 Cook says he expects to "chop the

price of the packaged product" and even tually discontinue selling its individual components. In addition to pricing changes, the ven-

dors are etching out new strategies to better compete in the changing market Two major changes are under way. First, with each enhanced version of its VM operating system, IBM fills in more holes that had represented pieces of the independents' business. Second, by position ing VM as the primary operating system for the 9370, IBM has opened a new market for the independents

So while the first change could lessen rket opportunities, the second could make up for the loss. Not surprisingly, then, most of the independents have al-ready announced plans for 9370 products. In general, these plans remain sketchy. VM Systems Group, for in-

stance, says it will announce two products the end of the year to "meet the needs of 9370 people

Sweeping changes

Among this group of vendors, VM Software seems to be making the most sweep-ing changes to its strategy. The vendor has been marketing a long lineup of utili-ties while also marketing an integrated collection of those tools as VMCenter

addition to cutting prices of VMCenter and discontinuing compo-nents, VM Software will introduce VMCenter II later this year, which will eventually supplied the original VMCenter package, according to Cook. The vendor says the new version will be geared toward departmental users. As a sult, what will eventually be the compa ny's flagship product will be aimed primarily at a new group of users. "VMCenter II will be targeted up and down the [370] line but to the 9370 in par-Cook says

Finally, the vendor also recently creat ion to market relational data base tools. However, Cook says this di-versification is "not because the systems software market is getting weak but because this new one is about to grow a lot.

Other yendors say they will be tailering existing products to 9370 users while also maintaining their existing customer bases. "We've got a bunch of products in the pipeline for 9370 users, but we'll still develop and enhance products that are technically sophisticated," Adeise's Foth We'll be going at it from both "he adds

The VM independents launched their industry in the late 1970s. Since the ad vent of VM in the early 1970s, users have been requesting additional features from IBM and have complained of minimal re-

A group of small suppliers, joined by a few mainframe software houses — such as Computer Associates International, Inc. in Garden City, N.Y. - stepped in to offer tools that increased the functionality of VM

Since then, the VM market has grown to \$85 million in revenue in 1985 and is expected to reach \$100 million this year. cording to International Data Corp. (IDC), a market research firm in Framing-Mass. Among the firms that exclu sively market VM utilities, the largest is

ITH EACH enhanced version of its VM operating system, IBM fills in more holes that represented pieces of the independents' business.

publicly held VM Software, which recorded \$18 million in revenue last year, acng to IDC In the last two years, IBM has paid

tem. With each VM release, such as the introduction of VM/SP Release 5 in October 1986, IBM satisfies more user requirements and lessens the opportunities for the independent software companies, market research analysts say. However, "There are always going to

Ours.

For Francisco Management

be holes that IBM won't be able to fill, so the independents can continue to pros-per," says Clare Fleig, an analyst with the International Technology Group in Los Altos Cahf

What is changing is the windows for the independents to fill are getting small says Romney White, president of VM/CMS Unimuted in Dorchester, Mass But "IBM can't make up in a release of two the neglect of 10 years," he contin-

Theirs

f . f / ncp/...........

IBM's ISF inter-system link and spool facilities da not support FBA devices.

IBM's ISF planned availability isn'il until August 1987.

IRM's ISE does

IBM's increasing support of VM hasn't had a negative effect so far, " says Constance Mays, vice-president of mar keting for VM Systems Group

We've tried to position our products in such places where IBM doesn't address user needs. And we hope that they don't step on as." Mays remarks.

These systems software vendors are also likely to face increasing competition from the larger software houses like Com puter Associates, although analysts do not expect that to have a major impact

Utilities are significant because VM requires a lot of components to work well But I don't see the big software compames making a mad dash to provide lots of new programs." International Technology Group's Fleig states

Two ways to expand your VM System.

VM Inter-System Foolities (ISF) from IBM						
IBM's ISF does not support Group 10 and 20 processors. In Group 30, ISF only supports 4381's with 16 megabytes or more, and 3083's in Group 40, ISF does not support the 3081 D16 processor						
With IBM's ISF, you can't use IUCV and VMCF across processor boundaries						
IBM's ISF is limited to two CPUs.						
IBAY's 15F affers na swetching capability						
IBM's ISF requires that you use HPO 4.2						
IBM's ISF doesn't do load balancing						

SSI allows multiple VM-based CPUs to communicate with each other in order to present a single system image to the users SSI is the only curre alternative to CPU upgrades that can keep user communities whole when the exhaustion of resources fragments those users onto multiple CPUs.

SSI supports FBA and Count/Key/Data devices

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-VMMCMS-

Expanding the vision of VM

Risk analysis service aims to protect buyers

Data Securities, DEC model claimed safeguard against third-party bankruptcies

BY NINAMARY BUBA MAGINNIS

SAN FRANCISCO - Data Securities International, Inc. recently announced a business risk analysis consulting service for software bovers who want to protect their application investments.

Data Securities developed its risk analsis model with assistance from Maynard. Mass.-based Digital Equipment Corp The hardware vendor plans to employ the model when purchasing software for in-

ternal use, according to James Chiafery, DEC's controller for corporate software

and consultant acquisition. The rick analysis is based on a mathemateral model that incorporates aspects of bankruptcy, lending and credit analysis formulas, Chiafery said. The formula can reportedly determine whether a specific third-party application requires escrow

protection "Basically, we're protecting company interests when dealing with third-party software vendors." Chiafery observed

"The computer industry as you know is made up of several smaller firms that go in and out of business on a regular basis."

There are approximately 5,000 to 7,000 software vendors of reasonable size. Chiafery explained. DEC buys applications from more than 10% of these sup-

phers for internal use, he said. By placing a software application in es row. DEC can have access to code and therefore be able to perform maintenance if a software firm is unable to. "What

ADR links

CONTINUED FROM PAGE 25

cresent's name. ADR spokesmen said.

\$5,000 for 100 copies, spokesmen said

we're really looking for is protection against a software firm's mability to sup nort the product." Chiafery noted. can easily say 'escrow everything,' and then you wouldn't need a risk analysis. That can be expensive and cumbersome to administer. It saves money to analyze which packages and companies make sense to escrov

Risk analysis Q&A DEC's version of the risk analysis me

reads like a workbook, Chisfery said. The user answers a series of questions and calites a score. "We wouldn't put a copy of Lotus in escrow because we think that will be around for a while. The model really helps us define under what circumstances it would make sense to excrem the software." he said.

Data Securities' version of the risk analysis model is based on a four-part methodology. The first part assesses how dependent a user is on the application technology.

The second phase estimates whether the software vendor can continue to del A personal computer file-transfer facilty has been included in Email that allows er adequate support throughout the appli cation's life excle. users to transfer data between a PC and

The third section quantifies the loss in an ADR/Email file folder, moving ASCII curred by the user if the software supplier ADR/Email Release 3.0 is available imfails to provide required support. The last lately at a price of \$21,500 for the section compares estimated risk with the IBM VSE operating system and \$35,000 cost of protecting the technology under

for the IBM MVS. The Disoss interface is While the mathematical model is perpriced at \$2,500 for both operating sysformed manually, it can be automated and tems and renumes Disoss Version 3.2 or later. The PC file-transfer facility costs incorporated in a spreadsheet. Data Secu-

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wasn't even cheap Now you are locked either into a tired interpreter, or into a supplier whose support organization seems to be on a different continent. Language Processors, Inc., an innovator in compiler technology, has

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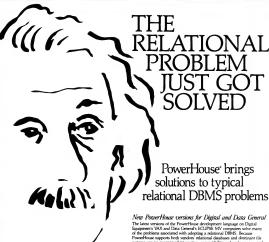
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Judge SQL

CONTINUED FROM PAGE 25

related subselect that relates a field in a nested query to the higher level query. The SQL data mangulation language also should include standard predicts such as BETWEEN. LIKE, IN and EX-STST. The SELECT command also contains the ORDER BY, GROUP BY and AWING clauses. The ability to do a UNION is essential. Of these predictates and commands, the EXIST'S and UNION, along with the nested query capabilities, are the features most often found missing are the features most often found missing

from vender unplemeetations.

Built-in functions that are common to both IBM and ANSI are AVG, MAX, MIN, SUM, COUNT and DISTINCT.

The math functions are executable within the WHERE and HAVING clauses. Null values, or the ability to represent absert acts, as an important aspect of SQL, SQL amplementations vary greatly in their treatment of nulls, since there is no clear.

standard.

IBM's data definition language uncludes commands to create and delete to bects such as tables and table gances. At present, ANSI does not address creation of indexes or spaces, nor does it contain any command to delete an object from the system. The lack of a CREATE INDEX command or any DROP command is a maor flaw in the ANSI standard.

Data types also differ in the two standards, and ANSI includes a CREATE SCHEMA statement. UNIQUE and PRIMARY KEY constraints are defined in the ANSI CREATE TABLE command, whereas IBM implements the same feature with a Unique Index and a

IBM offers enhanced VM batch facility

RYE BROOK, N.Y. — IBM introduced a

batch processing facility for its VM operating system recently that will replace a less sophisticated batch facility that has been on the market for free years The software was designed to allow us-

ers in the interactive VM environment to concurrently run batch jobs. With VM Batch Facility, users can schedule, submit, execute and cancel jobs. It is also said to allow them to monitor jobs in progress. With the addition of many features. VM Batch Facility reportedly provides

users with more flexibility than its predecessor, VM Batch Subsystem. IBM said it will stop marketing the VM Batch Subsystem, which was originally written for Intel Corp., in June

VM Batch Facility is currently available and can be used with YM/SP Release 3 or Let rank VM/XA SF Release 1 or 2. It can also run under the high-performance opton version of VM/SP Release 3 or later. The software ranges in price from 2 one time license charge of \$1,800 for low-end IBM 370 processors to \$7,200 for high-end 370s.

Not Null column sperufication, IBM addresses physical space allocation in its CREATE DATABASE, CREATE TABLESPACE and CREATE STO-GROUP commands. None of these commands are included in ANSI and are usually not found in other SO.

implementations.

Views are another integral part of SQL's data definition language and should be defined using standard SQL SELECT.

be defined using standard SQL SELECT statements.
The data control language includes the ability to grant and revoke user authority. Security can be established directiv on objects such as tables or, for finrectiven objects such as tables or, for fin-

er control, on views.
Two other components that are important to any SQL system are the system catalog and optimizer. ANSI provides no direction on the system catalog, so vendors either avoid unplementing it or use IBM's catalog structure as a guide. The lack of a catalog definition is probable the new commence of the structure.

bly the most serious problem with ASSES of chefitation. It is here that vendors differ most. This is unfortunate, since the system catalog is an integral part of any future attempt to connect SQL data bases. The optimizer, as already mentioned, should also be considered mandatory in SQL system. The optimizer automatically selects the most efficient must not retrieved upon the significant of the significant content of the significant three of creative age date. The SQL linear of creative age and the significant content of the significant content content of the significant content content content content conte

views that SQL provides logical data independence between application programs and physical data structures.

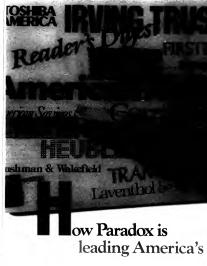
and physical culta structures.

A product that fugly anglements SQL.

A product that fugly anglements solven
of the 12 rules constructed by Edgar

Codd for relational data bases. SQL,
therefore, can be used as a measuring
role for fieldiny to the relational model. Of
course, SQL will be expanded so that it
will eventually satisfy all of Codd's rule
under the solvent of the square of the code
chasing relational data bases should look
to a full SQL implementation as the best
insurance for its long-term investment.

define any access paths. In fact, SQL Biolostein is wice-president of Mishrest operadoes not even allow direct references to an index. It is through the optimizer and Group



D

to get more done.

Today more and more top comp

are shifting their database standard. Af-ter evaluating dBASE* and R:BASE*

and every-other-base, they're reaching

one conclusion—a powerful relational database called Paradox.

says Greg Salcedo of California's Amer

ican Savings & Loan. "Out of the data

bases I've used, Paradox is easily the best," reports luber Hubbell of Toshiba

America. "Paradox occupies an impor-tant niche dBASE couldn't fill." con-

Hundreds of companies agree: Paradox is

easier to learn, easier to use, and more

"We compared Paradox, dBASE and R:BASE side by side. Paradox made is easier to do more," says Marry Hathaway

By working with our familiar Lorus-

like interface and ineutive "query by ex-ample," users easily analyze data in ways

previously beyond their capabilities

"With Paradox we're getting information that was just too difficult to reach be-

fore," explains Gerard Nussbaum of ac-counting firm Deloute, Haskins & Sells

cludes Fred Parlato of Georgia Power

Friendly Acqu

at American Airlines.

It has set the standard for the future,"

Systems software

Boole & Babbage, Inc. has announced IMF 2.3.0, an updated version of its in-tegrated family of products for the man-

agement of IBM/VS DB/DC systems The new release is said to offer tools for performance and operations manage it as well as IMS/VS system reporting and accounting. Enhancements have been made to the reliability, availability and serviceability and the IMF System Man-

ager, the vendor said. Features include a time initiated Exec facility. IMF products are priced from \$12,500

Boole & Babbage, 512 Oakmead

Pkwy., Sunnyvale, Calif. 94086. BBN Software Products Corp. has an-

nounced a version of its Quality Control Analysis (OCA) software for IBM's 9370, 4300 and 3090 series mainframe iters and plug compatibles under the VM operating system

QCA software is a product option to RS/1, the core of the vendor's RS series of data management and analysis software. It is an interactive data analysis and graphics tool said to provide a range of quality control and manufacturing appli-

Paradox is taking over the database standard

at hundreds of top companies by making it easier

cation functions, including control charts, inspection sampling plans, custom charts. process capability studies and trend anal

The QCA product for IBM mainframes is priced at \$10,000 BBN Software Products 10 Execut St., Cambridge, Mass. 02238

SAS Institute, Inc. has announced Version 5 of the SAS System for Data General Corp.'s Eclipse MV series under AOS/VS

Version 5 is said to offer five additional products as well as enhancements to bas SAS and SAS/Graph software. Additional products include SAS/AF software for building menu-based front ends: SAS/FSP for letter writing spreadsheets and inter-

active forms-onemed data entry, editing and query: SAS/ETS for financial plarung, forecasting and modeling, SAS/OR for project management; and SAS/IMI for interactive matrix programming First-year corporate license fees range

from \$1,000 to \$8,000 for each of the software products SAS Institute, Box 8000, SAS Circle,

Cary N.C. 27511 CPT Corp. has announced Revision 5.0 software for the Office Dislog Sys-

tem family of integrated office solutions. Revision 5.0 features a Data Impor and Custom Menu Utility for importing binary files and third-party applications, a productivity tool designed to speed daytoday tasky and Datagrams, an electron sc-mail facility. Other features include a document-oriented formatter for central printing on laser printers and an expanded facility for optical character recogniti

Enhancements have also been made to the wide-area networking and total text search functions as well as to the Office. Dialog System relational data base management system, spreadsheet, programming languages and resource manage-

Prices start at \$2,400 CPT, P.O. Box 2958, 100 Mitchell Road, Minneapolis, Minn. 55440

Saddlebrook Corp. has introduced the Advanced System, an integrated information processing system for financial services institutions

Advanced System is said to incirate an integrated data base and Saddlebrook's Chent Controllable software architerture on Duntal Foundment Corn VAX computers. Capabilities include de posit processing, loan servicing and electrons: funds transfer as well as the ability rence accounts in the san

Report writing functions allow users to select, sort and total information about accounts, customers and transactions Advanced System, including hardsoftware and implementation. is priced from \$1.25 million to \$3 million Saddlebrook, 101 Main St bridge, Mass. 02142. Applications packages

Deneb Systems, Inc. has ported its Deneb Construction Accounting &

Estimating System to the NCR Corp

Tower series under AT&T's Unix System V Release 3 operating system. Writen in Cobol. Version 3.0 of the Deneb System includes applications for

payroll sob cost purchase orders accounts payable, accounts receivable with inventory, general ledger, bank reconcilation, item billing, equipment control, estimating and order entry. Version 3.0 also provides a multiuser function The Deneb System is priced at \$1,295 per application Deneb, Suite 2C. 201 Riverside Drive. Dayton Ohio 45405 Expertware, Inc. has announced Re-

lease B of both its Configuration Management Toolkit (CMT) and its Documentation Support

(DST) products The enhanced versions allow users to incorporate information from forms produced by the DST into configuration mai

Capital Gains Paradox is faster than dBASE across the board sorting moveds at twice the speed "The only thing you give up when you leave dBASE a frustration," notes Salocio. Paradox Application Language (PAL) helps programmers build rich applicarions in less time, cutting development

costs by up to two-thirds Everything considered, it's no won-der that at Trammell Crow, eacht deents independently decided to ake st their standard

Mega Trend

This grass roots support is sweeping companies everywhere. Paradox is taking over the database standard at Brown & Williamson, Sperry & Hutchinson, Litton Guidance and Control. and hundreds more. Observes software developer Burt Alcantara: "Paradox is rly the standard for speed, perform ance and ease of use. Widespread acceptance is making it the industry standard

To make it yours, call 1-800-447-4700, Department 202 for information and the Ansa dealer nearest you, who can give you a free Paradox Preview demonstration diskette. In the U.K., call 01.580.4766



largest takeover

APRIL 20, 1987

Continued from page 31

agement reports. Incorporated in CMT Release B is a verification tool that enables the configuration manager to ensure the integrity of a configuration's data base and to verify that the common components of the configuration are properly

Both products run on computers rang ing from the Digital Equipment Corp. VAX/VMS systems to the IBM Personal omputer AT. Prices start at \$12,000 for CMT and \$10,000 for DST Expertware, Sute 220, 3235 Kifer Road, Santa Clara, Calif 95051.

Manufacturing Decision Support Systems, Inc. has added the Estimat-

on-line system designed to support manu-

facturing decisions. The module is said to allow users to strol a company's pricing policies for existing products as well as to determine costs and pricing strategies for products in the development stage. Quotes can be generated from estimates, other quotes or directly from standard product definons, Features include transfer functions

what-if" capabilities, a generic formula file and unlimited or rements at any level, MDSS runs on the Hewlett-Packard Co. 3000 series. The Estimating and ting module costs from \$5,600 to

Manuf ring Decision Support Sys ms, 1717 E. 9th St., Cleveland, Ohio

Access Technology, Inc. has an-nounced Release 2 of its 20/20 integrated spreadsheet for Data General Corp.'s MV series computers.

Release 2 is said to provide greater emostibility with Lotus Development Corp 's 1-2-3. Enhancements include optional letter and number cell notation, adanced macro capabilities including worksheet-based macros and new

20/20 Release 2 is priced from \$2.800 to \$9.800 Access Technology, 6 Pleasant St., S. Natick, Mass. 01760

Languages

duced a version of its Fastbol Cobol maintenance software tool The new release is said to improve processing efficiency and add the capability of automatically merging copy code into the Cobol program being analyzed, Fastbol

also provides a facility for removing the expand copy code that has been added for alysis purposes but has not been modi-Fastbol runs on IBM mainframes with

VM or MVS operating systems. Fastbol with conversely expansion costs \$25,000. Analytic Sciences, 55 Walkers Brook Drive, Reading, Mass. 01867.

Jeyco Software has introduced Softkey, a VM/VSE performance product Softkey is said to allow the full system integrity provided by lockfile to be accessed at processor speed, eliminating

the bottleneck of disk access. Softkey is priced at \$4,000 for systems below 3,0 million instructions per second (MIPS) and \$6,000 for contents at 3.0 MIPS or above.

Jeyco Software, P.O. Box 5966, Lincoln, Neb. 68505.

Duquesne Systems, Inc. has an-nounced DASDMON Release 1.5. panded cache-use measurements, said to allow a user to determine the efficiency of cache controllers. Users can view com plete cache-lut statistics and read/write ratios for individual jobs and data sets. Release 1.5 also contains a data set placement manager component that identifies problems on specific volumes and naths. The real-time tool automatically mea

the performance on MVS and MVS/XA systems and analyzes problems. DASDMON costs \$12,500

Duquesne Systems, Two Allegheny Center, Pittsburgh, Pa. 15212. Isomorphic Systems Inc. has en-

hanced its Iso Form software utility said to provide data extraction, data movement, data restructuring and data format-

Iso Form now includes new IMS and DB2 interfaces. It uses standard file defirotions found in cataloged Cobol or PL/I file descriptions, IBM DBDs or PCBs. DB2 tables or Views or other standard file definitions. It permits selection or condimail retrieval based on logical screening Iso Form is priced at \$35,000 Isomorphic Systems, 1103 Westgate

Development tools

Diversified Software Systems, Inc. has announced Release 5.0 of its Docu/ Text automated documentation system for IBM and compatible systems running OS/VS1 or MVS

Docu/Text is said to extract and anaze data from existing sources, such as IBM lob Control Language libraries, and

present data in a useful format Release 5.0 features an on-line query facility for the Operations Documentation and on-line support through IBM's Inter-active System Productivity Facility. Docu/Text costs from \$9,500 to

Diversified Software System mesota Ave., San Jose, Calif. 95125.



COMPUTERWORLD

MICROCOMPUTING



William Zachmann

Zooming in on modems

Anyone who doesn't believe that lower cost compatible products can offer first-class value and reliability basn't had any expersence with modems from Boston-based Zoom Telephon ics, Inc. The company's Zoom/ Modems for IBM Personal Computers and compatibles, which are Hayes Microcomputer Prod ucts, Inc. compatible, are as good as any I have seen and test-

Zoom Telephonics offers both 1,200 and 2,400 bit/sec modems in two models. The ST models, in addition to all the basic Hayes compatibility fea tures, include a "Demon Dialing" facility to keep trying a busy number until it is answered. Other features include audio mout and output jacks as well as an ability to work as COM 1, 2,

or 4. Built with the high-speed 16450 universal asynchronous receiver transmitter, they are able to work with 8-, 10- and 12-MHz PC AT-compatible sys-tems as well as with Intel Corn. 80386-hased systems

Besides the standard fea tures of the ST models, the XL models include a clock/calendar Continued on page 34

Apple's goal: Meet MIS head-on

It has been an exciting first quar-ter for Cupertino, Calif.-based Apple Computer, Inc., which has showcased a formidable array of products at three Apple-oriented conferences in the last two months. Among the products ur veiled were the Appleshare file server, the Appletalk PC Card, the Open Mac and the Unix Mac - pieces that Apple hopes will each contribute to the firm's success in the business market. Deite these achievements, Apple large corporations where IBM is

the rule and the failure of the Marintosh office" has not been for gotten. Apple is well aware of these obstacles, but does not Charles Berger, Apple's vicepresident of business development, recently spoke with Com-traternorld Sensor Editor

Patricia Keefe regarding his

and Fortune 1,000 campa nies to Apple? We think they are very important. Although we've spent more time working with individuals within large companies, we've laisol spent an awful lot of turne with the MIS depart ments, demonstrating to them three things that they were con-

cerned about with Apple, and to some extent still are The first is that we have prod

ucts we think offer significant advantages over other PCs avail-able to them. The second is that we can provide, and are providing, connections into the environments that they have created within their companies, whatever they happen to be - the nettems environments. And third, we are capable, as an organization and through our resellers, of providing them with the support forts that they need

What is Apple's share of the Fortune 1,000 market? We don't have a good estimate. I think Ricement Week and some thing on the order of 7%. If we were in the 10% to 20% range within a year's progress, that

How badly did the failure of the Macintosh office hurt Apple in the business market?

I think the Macintosh office was probably an idea a little bit alsea of its time. It showed a little bit of our namete in terms of what it products. I think it set us back only in that it burt our credibility. It didn't help me in the past year where we were promising open architecture machines, file servers and other connectivity Some Jusers | said, "Yeah, just like the Macintosh office

into some skepticism? Oh. absolutely Now that we have all the products here, the credibility gap that was created

has certainly been narrowed Yes, but how much of the resistance remains?

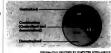
would say Ithat resistance! has substantially lessened over the the introduction of the new products. We've been able to prove in ne specific area, desktop publishing, that we have a clearly perior solution. We've also been able to prove that un general productivity areas, we are as



Continued on twee 3

Data View

MIS structures



ucts for IBM Personal Computers and compatibles

BY T. A. ELKINS

Benchmarks are one of several tools that give a prospective user insight into an otherwise unknown product. Programming languages can reasonably make use of a fairly intimidating num ber of such tests, and a number of benchmarks have been run on

uned. One area that has not comfour-part series on Basic prodmonly been given sufficient attention is floating-point and transcendental speed and accu-

Floating-point calculations

Benchmarks probe Basic

are relatively common computer tasks and rank among the slow est performed, while calculating such transcendental functions as common logarithms probes deep note the ability and refinement of ming system Systems with good marks here have a Continued on tage 35

Users want software management improvements

Survey finds corporate buyers unhappy with upgrades, bugs, copy protection

BY PEGGY WATT

The fact that user gripes about upgrade hassles, bugs and copy user-complaints survey came as no summise to software publishers. But airing those com plaints can only encourage com promise, according to representatives of both user and vendor In a draft survey on corpora

buying concerns by members of ew York-based Microcomputer Managers Association, the managing upgrades and vendors' reluctance to acknowledge bugs were named as users' biggest gripes. Disdain for copy protection and the desire for site b censes to make manage easier were also mentioned fre-

quently. The survey covered the 350 members of the association who represent more than 200 corporations located mainly in the greater Manhattan area Members were asked to comnent on the draft results and

mention any other key concerns to be included in the final draft. which may be released at Comdex/Soring '87 in June, said Alex Kask, president of the Micro-computer Managers Association and senior manager at Ernst & hinney in New York. The biggest complaints were

on methods of handling upgrades. The survey estimated it could take from 17 to 32 weeks and 450 man-hours to undate 100 copies. The process includes evaluation, budgeting, orders, installation and training, in addition to collecting the old ver-

'In the real world, the pro cess can take a year to comnlete and users often do not need or use the new canabilities. the survey said. A new version may even be announced before the upgrade is completed. Yet if the vendor discontinues the earher version, the corporation is forced to upgrade anyway. Kask

While users do not want an ingrade for every him they say they at least want to be informed of them. "Only users can accu rately determine the impact of the bug on their work." one drain ment said.

Copy protection remains ntinuing complaint. Kask said Convintation will be an issue as long as one major company still has it," he added Most users' concerns were not new to vendors, but many can be resolved as marketing is time said Kenneth Wasch, exec

utive director of the Software Publishers Association (SPA). who took an early look at the sur vey. Removal of copy protection is regarded as a positive selling point for example

While the survey suggested that copying documentation be allowed. Wasch cautioned that allowing such copying invites if licit distribution. "When there's no copy protection, the one manor impediment is limited copies of the documentation," Wasch

said "Not every organization is concerned or successful at stopping unauthorized copying. Yes Continued on page 30

APRIL 20, 1987

COMPUTERWORLD

Zooming in

with battery backup. Touch-Tone pass-

word security for incoming calls and a Touch-Tone decoder. The latter, when used in combination with the audio input jacks, can be used with voice-generation equipment to create a dial-in audio-re-

Another feature of the XL models is an 8K-byte random-access memory buffer that can be used to receive messages or small files in the background while the user is doing other work on the system. The buffer can be expanded to 32K bytes All this is on top of a basic modern that provides very reliable communications

with remarkably low error rates. The Zoom moderns appear to work on phone lines that give other products noise-interference problems And if that isn't enough, they also

come with a two-year warranty. At list prices of \$349 for the top-of-the-line Zoom/Modem PC 2400 XL (\$319 for the ST model) and \$219 for the 1200 XL (\$199 for the 1200 ST), the systems add

The inclusion of the unique Demon Dialing feature is no accident. It was frustration stemming from problems getting through to a telephone number for tenns court reservations at MIT that led Frank Manning and Bruce Kramer to invent and build the first Demon Dialer in 1975 Manning and Kramer, along with T

up to a terrific value

Pat Manning and Peter Kramer, founded Zoom Telephonics one year later with the intention of eventually selling a Demon Dialer for regular voice telephones

After starting with a simpler product -The Silencer - that was just a switch to turn off the ringer on a telephone, they finally introduced the Demon Dialer in 1981. Their first modern product was a 300 bit/sec. model for the Apple Computer, Inc. Apple II. Zoom's considerable experience with

telephone system tone-detection and response prior to getting into the IBM and compatible modern business early last year has paid off. The technical abilities of its moderns have proven, under test, to be significantly better than those of its competitors.

A well-written and quite comprehe sive manual makes installation a snap There are four jumpers and one three-

position DIP switch on the card that can be set for various special options. The Zoom/Disk software that comes with the moderns supports the moderns special features, is well documented and quite easy to use. The Zsetup program can be used to configure the modern. It will also create an Autooxec file to cet the system clock from the clock on an XL

model if you wish. Other programs let you use the om/Modem to dial voice as well as data calls, set up an incoming message buffer, create a dial-in welcoming message, set up password screening and direct Haves-style AT commands to the modern

m the keyboard

The Zoom/Modem works well with xisting communications software. The Zoom/Disk software, for the most part is directed toward making the enhanced features of the tool available to users The second part of the Zoom/Modern PC programmer's guide offers a well

written, detailed description of the add tional features of the product and how to make use of them. Sophisticated corp rate users interested in making use of PCs for serious applications requiring modem communications will find that the Zoom/Modern 2400 XL offers many use

The Zoom/Modern PC is an excellent fuct that delivers solid value. If Zoom Telephonics was a larger and better known company, its share of the modern market would be growing even faster than it is, limited by the company's relatively modest advertising hidget

In this case, however, having built a better mousetrap is likely to make Zoom a more well-known company as word of its products gets around. It isn't very often that you see a product this good priced so aggressively

Zachmann is vice-president of research at Internal

Driver links Mac. impact printers NEW YORK - Brother International

Corn. last week unveiled a software dryer that enables users of all Apple Comput er, Inc. Macintosh computers to create documents on its entire line of impact printers.

Jointly developed with Softstyle, Inc. of Honolulu, Macdriver addresses the one obvious limitation of the Macintosh — a lack of printer options beyond Apple's Imagewriter dot matrix and Laserwriter laser printers. The driver, marketed by the Piscataway, N.J., subsidiary of Broth er Industries Ltd. of Japan, allows its low cost 9- and 24-pin dot matrix printers and a dual printhead dot matrix/daysywheel printer to generate hard only from Ma-

cintoshes Available now, Macdriver lists for \$99 and comes with cable, software and operating manual. Macintosh users can connect the cable to the computer's serial port and copy the software onto their sys-

Brother said it began developing Macdover about one year ago at the request of its resellers.

The New CPT 9000. Bigger, Faster, and more Productive than Macintosh.



Run your favorite desktop publishing software on a full-page, high resolution. black-on-white screen.

The larger screen on the AT-compatible CPT 9000 allows you to view and work on a full-page document. At the same time. You save the time and effort Macintosh users spend scrolling up and down. / Visualizing the entire page

means a more creative

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input and a more productive output. /

And connected to a CPT Laser Printer,

the CPT 9000 system can print camera-

ready materials faster than the Macin-

tosh. / The CPT 9000 workstation is

expandable. Eight slots offer you the

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opportunity to keep up with your

The CPT 9000 starts at \$3,995

Renchmarks

high likelihood of being good in general. Regrettably, many benchmark tests were designed for dramatic impact, which inflated results seem to aid. For this series. I will use a floating-point and transcendental test I designed to be largely free of false results. In addition, this test shows off some of the power of a good

programming approach without the hype. Some years ago, a class of my graduate students told me that a problem I had given them was impossible. Upon investigation, we discovered that what had really happened was the correct result caused an overflow on their pocket calculators The answer involved a factor of 10 to the power of about 400. The correct approach to this problem required a modest owledge of common logarithms

ular issues can arise with statistics in which large permutations or combin

tions are involved. With this insight, examine the problem of finding the factorial of 10,000. Recall that 4 factorial (4!) is just the product of multiplying 4 by 3 and 2, or 24. On a handheld calculator, with 10 to the 99th power as an upper numeric limit, you can calculate 69 factorial. Different computer systems overflow before a couple hundred

ASIC has nearly come of age. Most modest to medium-size projects can be undertaken, at least for logic test purposes, in Rasic

actorial. But 10,000 factorial has exactly 35.660 decimal digits

And we arrive at Elkins' Log (10k!) speed and accuracy benchmark. This number can be calculated by the following very simple Basic program

10 DEFINT 1

20 DEFDBL X.Y 30 FORI = 2 TO 10000 50 X = X + LOG(Y)

60 NEXT I 70 PRINT X/LOG(10#).

The variable I is defined as an inte to loop as fast as possible, and the PRINT statement includes the denominator Log (10#) to convert the Log function to base 10 from whatever base (usually e) the sys tem uses. Notice that the 10 in parenthe ses must be double precision or the results will lose half the accuracy. Note also that this last division has a negligible of fect on the runtime of the test program.

The time to execute this program de pends almost entirely on the calculating ability of a computer/Basic programm language system. The accuracy of the results is a telling indicator of internal precision as well as a fine complement to the usual benchmark tests

In addition to the raw numbers, bench narks give insight into a programming language's utility, just from the effort o running them. This extra data is usually not included with the numeric results Ease of use started with APL. The benchmark used here was just a bit of a single line of command-line code for APL,

rung effort was nearly zero. MathCAD came in second for ease of use with two statements in a single line of code, no program needed. Of the Basics, True Rosic was first in ease of use. With, out any need for type declaration, the True Bassc program was half the length of the listing. Points off, however, for True Basic's silly PRINT USING requirements

and its mability to read in the program from another Basic's file Better Basic, GWBasic, Quick Basic and ZBasic all came in tied for fourth place. In each system the program was just read in, compiled/interpreted in memory and run right from the programming editor. All of the other systems were letely compatible with the program SAVED, A from GWBasic.

There is a considerable jump in work-load with the IBM compiler. The program can be read in directly, if it is available; it cannot be written in system as is possible with the other Basses. It must be compiled with the /O option, then linked with the separate link program to produce an independent EXE file

The 87Basic system was even tricker For some reason it would not link without pecifying the full file spec for the library file, even though this file was in the de-

The results were that progams taking vantage of math coprocessors were the fastest based on the Log (10k) Bench marks. True Basic 2.01 took 31/2 seconds and Better Basic 2.1 took 10 seconds Quick Basic 2.0 took 56 seconds, and

GWBasic took 149 seconds, but none of the products take advantage of math co-

The size of the files created by the pr ams also varied. Better Basic created a 48K-byte file, with 82K bytes for True Basic and 27K bytes for Quick Basic For accuracy. ZBasic came out on too, with Better Basic close behind

In conclusion. Basic has nearly come of Two systems are nearly as fast as RM Fortran. Most modest to medium size projects can be undertaken, at least for logic test nurposes in Basic 1 know a Basic acceptably well.

Ellow is computer and management currenters

If only there were more ot you.



You can switch from, say, 1-2-3" to dBase II"or to Microsoft Word or to Microsoft Chart in a couple of keystrokes. Leave one program and iump to another

And you can select and edit information from several different programs. Then quickly combine and print it all on a single piece of paper.

We've only just begun.

Windows is a graphic extension of MS-DOS* which gives you a more intuitive way to work. Your bridge to a new generation of applications which can be easily integrated. And which take

In the Windows world, you move information freely

Do more work, more kinds of work, and do it faster A startling value.

advantage of Windows

common interface for

commands, options,

and data exchange

and you get a whole desktop full of applications to help you manage your day to day business In addition, you get

Windows Write, a graphically-based word processing program And Windows Paint, a simple, easy to use drawing program Not bad for \$99

Find out how productive you can be with a Windows office. Get all of yourselves down to your Microsoft dealer

And take a really good look into Windows

Microsoft Windows The High Performance Software

the of Microsoft Contraction 1.7.1 is a registered individual of Links Directionary Languages (Links II in a register of the and representation of MM IX or appet with an Otto Addison of Cooples Adaptive Microsoftway of the appet and a register of the appet and appet appet and appet and appet appet and appet and appet appet and appet appet and appet appet and appet and appet appet and appet appet appet and appet appet and appet appet appet and appet appet appet appet and appet appet appet appet appet and appet appet appet appet appet appet and appet app

Apple's goal

good or better. The timing of corporate networks coming together, and the need for work stations to access networks that people are wiling to use, has beloed as

What's your strategy for

tting MIS to consider Apple products?

the past year and a half, through our national accounts program, we have absolutely been focusing our efforts on no longer coming in the back door by just having a few people withan organization adopt the Macintosh, but [on] talking to the heads of information services. or DP or whatever their title

was, about [adopting] Macintosh as one of their accepted stan dards. [Getting on] the approved vendor list is very important, or

you virtually get locked out of a corporation. There is a fairly long list of companies who have taken us on as an approved vendor in the past year and a half.

How mony? I'm personally aware of 20, but

there are probably more than more the commonplace that

What are you doing to entice users entren-the IBM world? dominant, as DEC begins to make even more significant in-

roads. So the idea of multivendor

Second, we go after those with the same approach that any other processing or telecom munications company would that is, work very hard to show First, we're finding those [lands them why our technology is suof users] are less and less preperior

We'll emphasize where our product differs from others and why we think that's important to environments is becoming much husmess.

Improvements

FROM PAGE 33 firms with strong antiperacy poli-

He said he was surprised at users' comments that they do not hunger for frequent up grades. "We in the industry always push for more updates, more updates." Wasch said. He also agreed that every single bug does not require an upgrade.

"Obviously, users have a right to know about bugs that are major, but the SPA can't ask its members to send letters to users every time they find a bug," Wasch added

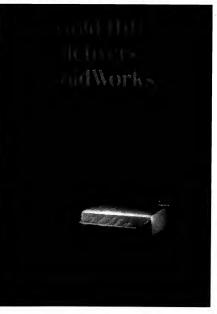
The SPA represents more than 200 microcomputer vendors, ranging from education and entertainment package developers to business software vendors

Pursuing site licenses Negotiated site licenses something recommended by the Microcomputer Managers Assonation survey to resolve many of the complaints -- are also a marketing issue some vendors choose to pursue, according to Wareh Pricing, support, long-term

obligations, distribution and legal rights are among the key tems to cover, the survey said Also, users asked vendors to propose licensing that meets in dividual customers' needs, not a

The typical survey respondent was a corporation or government agency with more than 100 personal computers, considerable in-house expertise and resources and minimum and specific technical requirements but unable to quickly react to industry changes because of the numher of mere involved. Vet new systems are bought daily to run aundreds, if not thousands, of different applications software packages. The typical surveyed ny was installing computers in locations across the country or around the world

Kask said the survey has already been successful, by spurring debate and discussion among users and vendors. He said the survey will be presented to members of the ad hoc Microcomputer Vendor Advisory Board, composed of representatives from large vendors and vendor organizations, including the SPA



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on System Uni

Systems

CIE Systems, Inc. has introduced the CIES/286, a multiuser IBM Personal Computer AT-compatible system. The CIES/286 is said to support Pick Systems' Pick Operat-

w

mg System, Unix, Ryan-McFarland Corp. COS and Microsoft Corp. MS-DOS operating systems. It is based on the Hill Corp. 80286 processor running at 6, 8 or 10 MHz with memory expansion to 12M bytes. It features standard RS-232 cables. The standard models include

D

a two-user system with a 40Mbyte hard disk drive. floppy drive, 512K bytes of memory and a system console for \$5,960; a six-user system with an additional 60M-byte streaming bedrive, priced at \$8,085; and a nine-user system with a 70Mbyte hard disk drive, priced at

\$9,800. CIE Systems, 2515 McCabe Way, Irvine, Calif. 92714.

Saftware applications packages

Cimpac has introduced Cimpal Manufacturing, an integrated inventory and production-control system.

The Cimpal package is structured within Oracle Corp.'s Oracle relational data base system.

It operates on a variety of bardware systems including IBM Personal Computers and minicomputers from vendors such as Digital Equipment Corp.. Hewlett-Packard Co. and Prime Computer, Inc.

The nature license for Cimpal Manufacturing on an IBM PC costs \$12,000, including an Oracle runtime license. Cimpac, Damonmill Square, Concord, Mass. 01742.

Iconnex Corp. has announced M. E. Workbench, a personal computer-based mechanical engineering software product. The software is said to combine geometric modeling, variational geometry, equation-solving sorgadished; and word

guneering software product. The software is said to combine geometric modeling, variational geometry, equation-solving, spreadsheet and word processing Changes made to the design, automatically trigger data recalculations systemswife, so the windows aboys reflect the most up-to-due data on the design. The conceptual design may.

be transferred to standard computer-aided design, manufacturing and engineering systems, according to the vendor.

M. E. Workbench costs \$2,350.

\$2,350. Iconnex, 1501 Reedsdale St. Pittsburgh, Pa. 15233.

Saftware languages

Eyring Research Institute, Inc. has ported Certified Software Corp.'s Omegasoft Pascal to run under its PDOS operating system.

Omegasoft Pascal meludes a compiler, assembler linker, host-debugger, target-debugger, screen editor and Pascalshell. It is said to produce relocatible object code directly, ready for linking. The compiler coargenerate assembly language source. Runtime source is included with the compiler.

Eyring Research Institute, 1450 W. 820 N., Provo, Utah 84601.

Avyx, Inc. has announced Trees-PLS, a programming language for IBM Personal Computers. PC XTs. ATs and compa-

tables.
Trees-pis is said to allow programmers to create applications for scheduling projects that must be completed within a fixed amount of time. It is a resourcemanagement tool featuring the ability to perform hist-processing types of functions by manipulat-

ing tree structures.

Trees-PLS is priced at \$995.

Avyx. 265 Honeywell Center
304 Inverness Way South, Englewood, Colo. 80112.

Software utilities

Transec Systems, Inc. has announced Unlock Masterkey, which is a copy protection re-Continued on page 41

Now you can build and deliver serious expert systems on advanced PCs.

GoldWorks changes the economics of expert system building.

System Watership of control of Gold Works, homeofy code-named Acces, is designed for professional software developers who need to build excluse capert systems and inspire them with conventional application running on 286- and 366-based Pol. It considers the best features of Pol. It considers the consideration of the Pol. It considerates the policy of the Policy

Sorks like a shell.

features of an expert system shell. With the easy-to-use mean interface you can explicit periodype and built expert system applications without moving the underlying programming continuous absolute the substitution of the cold/Which substitution, an on-line below you can ad compile applications to get you started quickly:

GoldWorks gives you the best features of an expert system toolkis. gramming cuplements to extend and customine the system for your specific applications. And you can address up to 15 MB of extended memory on the PC AT (and even more or 166 hourst PC AT)

nor on 365-based PCs).
Works like expert system tools previously available only on high-end workstations . . . at a fraction of the cost

capor system development and deli cryon enforced FO. No get framewith multiple industration for flexible important jumpated flexible important important jumpated flexible important industration, Object programming for developing analysis of provided industration, Object programming for developing analysis of provided for developing angiones, including rule sea, sponsors, rule optorties, corrustedy factors, and extensive rule important and definition of the language and delinquisting facilities. All on conventional introduser—

the PC you streaty use.

Works to develop and
deliver your expert system
Guidflords is the gay you that
lets you develop and deliver section

GoldWords is the carly void that lets you develop made deliver earlies compart systems on PCABA, And GoldWords also takes advantage of PCABA and an anticky powerful 80-366 processor, including the COMPAQ DESCRIPTO 566 and Gold EITH 366 LIPP System.

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attandard by which all other capert, yaytes motors will be measured, it was extensively leid-tented by developes in disease of major corporations. And Goldwode is backed by Gold testicomprehensate consource report. More you have the capert system. Believe you have the capert system builded that works the way you want so work.—GoldWorks. To see how works, earlier our unique Demonstration Ris, including full color video complete User? Golde. It color 149 complete User? Golde. It color 149

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Continued from page 37

Unlock Masterkey is said to have the ability to break more than 80 specific programs. It has on analyzer that determines if the copy is protected by either Prolok or Superlok. It includes a generic unlocker for unlocking programs protected by either of the two and a Superiok unlocker for programs installed on a hard disk. According to the vendor, the unlocked programs are identical to the original, with the

copy protection removed Unlock Masterkey is available for the IBM Personal Computer, PC XT and PC AT. It

Transec Systems, Suite 200, 220 Congress Park Drive. Delray Beach, Fla. 33445. The Source Telecomputing

Corp. has introduced Re Source, an IBM Personal Com puter interface software pack The software is said to simple fy the use of on-line services. Ac cording to the vendor, it simple the codes stens commands necessary for the user. It sets up a card catalog

that contains descriptions of the product and allows users to auto mate frequent tasks. It also allows interactions between the service and the user to occur off line. User entries can be edited and corrected before a connecon has been established

Re:Source is priced at \$89. The Source Telecomputing, 1616 Anderson Road, McLean, Va. 22102

Micromath Scientific Software has announced Directory Window, a memory-resident di

The utility is said to provide access to various file commands

the primary computing activity displayed on the screen. Users can scroll through Microsoft Corp. MS-DOS file directories. Directory Window is priced at

\$14.95. Micromath Scientific Soft ware, Suite 204, 3690 E. Fort Union Blvd., Salt Lake City, L'tab 84121

Custom Real-Time Software, Inc. has announced Stopwatch, a memory-resident utility said to measure and present total and component t of programs executed on IBM Personal Computers and compa

ribles Stoowatch makes measure ments independently of clock speed or type of processor, the dor said

The Stopwatch package in cludes a diskette and a user's manual. It costs \$59.95 Custom Real-Time Software P.O. Box 1106. West Caldwell.

Software enhancements

N.I. 07007

Articulate Publications, Inc. has announced the second ver sum of the Extended File Handling option for the Medicalis & Dentalis health-care practice management system run ning under the CP/M-86 and Concurrent-DOS operating sys-

Medicalis & Dentalis features pop-up wardows, electronic claims submission and automatic insurance prevenfication and benefit predetermination, ac-

cording to the vendor. Medicalis & Dentalis is priced The Extended File Handling

n costs \$995 Articulate Publications, 402 N. Larchmont Blvd., Los Angeles, Calif. 90004

Data Business Vision, Inc. has appropried Novell, Inc. Network compatibility for IBM PC-DOS, CTOS and BTOS systems for its family of graphics soft

ware, Private Eye, Graffhopper and GDSS Private Eve was designed to up-to-date provide on-line. graphics and text reporting using customized menus. Graffi hopper includes 101 preformat ted graph types and customizable command lan-

guage. The menu-driven soft is said to interface with various data file types and to accept hatch processang GDSS provides all the chartone features of Graffbonner plus advanced charting functions.

statistical analysis, data query functions and freehand drawing Depending on the operating

system, Private Eye costs from \$99 to \$1.500 Graffbonner costs from \$295 to \$2,000 and GDSS costs from \$795 to \$3,500. Data Business Vision, Suite

B. 3510 Dunhill St., San Diego. Diversified Computer Systeme. Inc. has announced an enhanced version of its EM220 Digital Equipment Corp. VT220 and VT102 term package and its EM4010 Tek

onix. Inc. 4010 and VT220 emulator The emulators are said to in-Wordperfect Corp. s Wordperfect mode that allows users of the DEC VAX version of Wordperfect word processing software to edit documents us mg keystrokes identical to those used in the personal computer version. Other features include support for the IBM enhanced

The Court

keyboard, additional 132-col modes and support for the Ungermann-Bass, Inc. local-area network, Net/One. The emulators also transfer Wordperfect documents between the person-

computer and the VAX Computers are \$169 for the EM220 package and \$249 for the EM4010 package Diversified Computer Sys-

Xerox Corp. has enhanced its Xerox Ventura Publisher software for the IBM Personal

Computer 80 new features including conon for Hewlett-Packard Co. Soft Fonts and the ability to use the entire library of Adobe Sys-

fonts with any Postscript print-According to the vendor, oth er enhancements include the ability to import text files from word processing packages; support for all three industry-standard page-description lansupport

umultaneous on-screen hyphenation of English and any one of five other languages; pictures anchored to text; and font sizes up to 254 points The Xerox Ventura Publisher

guages:

*** €895 Xerox Xerox Square, Roch ester, N.Y. 14644.

Data storoge Systems Peripherals Con IRM Personal Computers.

sultants, Inc. has announced System/34, 36 or 38 via twin-ax the Remedy series of remov able Winchester disk drives for

mg IBM 5219, 5256 5224. 5225 and 4214 printers. It con

The Remedy series offers sin Introducing Stat Mux Deluxe.

gle half-height 5 %-in, disk drives ranging in capacity from 20M to

stalled in any PC with a hard-disk ontroller They use standard DOS utilities for copying files. Both ST-412 or small computer Pricing for IBM Personal Remedy newed from \$795 Systems Peripherals Consul-

ms. Suse 1B. 3775 Ins Ave. Boulder, Colo. 80301

National Memory Systems Corn has announced the Co 8006A system, a 689M-byte disk system for Compan Com The software now features puter Corp. 386 applications The subsystem is said to fea

ture a single-slot controller sug porting four disks and support for disk data rates to 2.45M bit/ tems, Inc. printer and screen sec. The C.8006A is said to be compatible with most networks It was designed for use with ou erating systems such as Microseft Corp.'s MS-DOS, Xenix. Micro Port Xenix. AIX and AT&T's Unix System V Release 3

tants, 9747 Business Park Ave

San Diego, Calif. 92131

hytes. They can be in-

The C-8006A is smooth at \$13,500 including controller cables and software. National Memory Systems 355 Earhart Way, Livermore Calif., 94550

Printers/Plotters/ eripherols

Digital Communications As sociates. Inc. has announced Alecprint, a stand-alone print er emulator Alecprint attaches to an IBM

ial cable. It is capable of emulat



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Continued from page 41 tains a parallel and a serial port allowing either type of port to be attached to a personal computer PC printers supported by Alec prost anchole the Mandatt Park. ard Co. Lasenet, the Eoson America. Inc. FX and LQ 1000. the IBM Proprinter and Quiet writer and the NEC Inform Systems, Inc. Spinwriter 3550/

8810 Alecprint costs \$1,395 Digital Communications As-ociates, 1000 Alderman Drive, Alpharetta Ga 30201

Microphonics Technology Corp. has announced its Lite-

The Litewriter printers are said to feature the vendor's Litewriter command language which gives the user control over the printers' output via Enelish-like commands - as well as the Litewriter font system. which is a custom-fort genera tion system that allows the user to vary typeface, point size. character skewing. rotation petch and vertical and horizontal

writer line of laser printers.

The Litewriter printers cost from \$1 995 Microphonics, Suite B, 25 37th St. N.E., Auburn, Wash.

98002

Baard-level New Media Graphics Corp. has announced the PC-Gra phover II. a graphics-overlay board set for IBM Personal Com-

to allow a PC to control videodisk playback and superumpose text and graphics on the video. It feaflicker-free display even while drawing graphics or text. full-screen overlay without blank moreins and 760- by 480-pixel resolution as well as a doublebuffered display memory for animation, the vendor said Software available for the PC-Graphover II includes an authoring package and a graphics point

ckage with 20 fonts. PC-Graphover II is priced at \$1,990 New Media Graphics, 279

ambridge St., Burlington, The PC-Graphover II is said Mass. 01803. Auxiliary

equipment

Ergotron, Inc. has announced Mouse Cleaner 360, a com outer mouse cleaning system. Mouse Cleaner 360 is said to clean the tracking rollers inside the mouse to eliminate serky movements and slow mouse reponse. The kit comes with a Vel ball. scrubber board, lint-free chamos cloth and a bottle of cleaning

solution Mouse Cleaner 360 is said to be compatible with personal computer mouses using a 1-in. diameter positioning ball, includsoft Corp's. Mouse for the IBM PC and Apple Comput

er, Inc. Macintosh, Apple fle, Ilc and HGS Mouse Cleaner 360 is priced at \$16.95. Ergotron, 1621 E. 79th St. Minneapolis, Minn. 55420.

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VSAM	VALVENS		Ring	
SQL-DS	VALVENS		Banyan	
IDMS	VALVENS		Novel	
ADABAS	DBMS		AT&T Startan	
MODEL 204	VS.DMS		IBM PC Net	
OSAM	DIF		Nester	

FOCUS is a complete system, with its own relational database management facilities, and with important capabilities not found in any comparable product. It includes the most pow erful report-writer and data-analysis system on the market Some Recent Appl

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tracking and analysis. Without resorting to third-generation pro gramming. At every level, the FOCUS fourth-generation language

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FOCUS in another PC. Or in an IBM mainframe. And FOCUS offers complete portability. Up and down the scale from PCs to mainframes. And across, from vendor to vendor, Any FOCUS application, regardless of the system on which it was developed, is ready to run on FOCUS

in any other environment FOCUS is supported by a national network of service offices and regional technical centers, backed up by a central hotline. It has over 300,000 satisfied users -more than any 4GL system on the market today. And it is the only one with an independent and

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SOUTH AND SOUTHEAST Atlanta GA Min 2 Baltimore MD Aur 2 Ft Landerdale FL May 5 Nashwille TN May 27 New Orleans, LA Apr 30 Baleigh, NC May 15 Tempa, FL May 13 Washington DC May 22 SOUTHWEST

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NETWORKING

Users boo Olsen's MAP attack



Battle at the LAN corral

work (LAN) vendors and analysts have said, "Whoever con

corporate account Look, it's the LAN shootout! It's dueling file servers! No it's the battle of the network operating systems! In one cor er we have the heavyweight LAN champson, Novell, Inc.'s lenger, Microsoft Corn.'s Networks (MS-Net), nee the LAN Manager, (Enhanced or other wise, the IBM PC Network Program software is not a seri

ous contender in this bout.) The trade press is abuzz possibly most long-term -showdown in the volatile personal computer networking arena. By announcing its intent to get apolications developers to a cept its MS-Net interface as the PC networking standard, Microsoft automatically sesumes the role of challenger to No-

vell's grip on a good part of the PC network market. The MS-Net protocol - in Continued on page 52 BY ROSEMARY HAMILTON

Mention the name Ken Olsen to manufacturing executives and you will quickly find that the Dig-

ital Equipment Corp. chairman is not a popular man these days. Olsen's recent criticism of the Manufacturing Automation Pro-tocol (MAP), the proposed factory networking standard, has stirred up plenty of anger among the ranks of the MAP/TOP Us-

In recent weeks. Olsen has publicly questioned the benefit of pouring time and money into establishing a new factory networking standard when, according to Olsen, Ethernet available now and is sufficient for

the factory environment Many manufacturers say they are outrained that Olsen would publicly gripe about MAP, and a few users have gone so far as to say that the DEC chairman was

swaying uncommitted users over to his company's proprietary networking system, Decnet, which is based on Ethernet All he's doing is throwing a bug into the whole MAP sys-tem," says William Geibel, staff electrical engineer at the Kaiser Aluminum & Chemical Com. in

Pleasarnon, Calif. "I am not happy with his remarks. I feel it's hurting MAP," he adds. "and I

vent of ISDN would make obso-

lete current specifications for

connection to communications equipment and services. Many of

the same managers told Compu-

terworld that they "didn't want

comes a commercial reality that

nilar attitude toward OSL

The ACDU is not alone: For-

rester reports that many survey

respondents described ISDN as

etill "more a concept than a busi-

ness application." One manufac-

turer said that while "standards

will play an important and key

users are afraid to become en-

thusastic about OSI because

they may not be in the majority

Some users seem to take for granted that standards group

meetings are primarily used by

vendors as arenas in which they

battle to get their proprietary

Continued on boar 5

to make the wrong move

role in our network planning

Continued on page 52

BY PATRICIA KEEFE SAN FRANCISCO - The cost of linking personal computers together to share files, printers and other resources drastically

exceeds user expectations, according to David Ferrs, chairman of the Ferna Corn This is because too riften iners forget to factor in the "peo-

Net costs exceed

estimates

nle costs' of network technol ogy, he said Ferns recently led a three-day Technology Transfer Insti-

tute seminar entitled "PC LANs: What You Really Need Know." Ferrin specializes in apto hear about ISDN until it beplications development and local-area networks (LAN) syswe can access," and voiced a

The primary costs of a LAN anse from the time needed to manage and administer the system, unproductive time consumed while using special networking facilities and the cost

Continued on page 51

. Third-party net vendors

rush to support PS/2, OS/2 Page 46. Rolm's IBM PC-to-CBX link uses standard software

Page 47 · Infotron Systems division univeils tabletop communications switch. Page 54

Vendors still dominate standards efforts

BY ELISABETH HORWITT

User organizations still are not taking an active role in communi catoons standards development efforts, even though many MIS and communications managers recognize that the outcome will directly affect their companies

networking environments Of 55 Fortune 1,000 compa nies responding to a Febru survey conducted by Cambridge. Mass., consulting firm Forrester Research, Inc., only 13% said they had influence on Open Systems Interconnect (OSI) stan dards development. An even smaller percentage said they had a writer in the evolution of Integrated Services Digital Network (ISDN), Manufacturing Automa-tion Protocol (MAP) or Technical Office Protocol (see chart

At a recent meeting of the New England Chapter of the Association of Data Communica-

neht)

tions Users (ADCU), several communications managers say they were unsure of what type of cabling to install in new buildings because they feared that the ad-

Standards organizations still lack user voice Some user company complain of being shut out by dors; others say



printf("Hello, world\n");

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and then give you the tools with which to manage that network on an ongoing basis.

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priorite company. Were a network company. So, in our 25 years of designing network solutions, we've worked with all sorts of equipment companies. And we've worked in countries all over the world. So we can maximize the performance and functionality of all the pieces of your network, regardless of which vendors they came from. Or where they are.

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cal that

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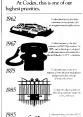
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The Networking Experts

Network vendors line up behind IBM

BY PATRICIA KEEFE

protected-mode MS-DOS

In the aftermath of the IBM product blitz, third-party network vendors are wasting little time announcing the obvious: To a company, they will support the IBM Personal System/2 family, along with Operating System/2, IBM and Microsoft Corp.'s

A chorus of network adapter manufac turers have pledged to retrofit their bardware for compatibility with IBM's new ro channel (bus) structure, featured in the PS/2 Models 50 through 80. Release whenever OS/2 ships

Palo Alto, Cahi-based Nestar Systems, Inc.'s contract to resell IBM's Token-Ring cards will probably be extended to include IBM's micro channel-compatible adapter cards, said Nestar President Charles Hart

We're hoping this wall give us at least a two-month sump on the competition he said. IBM expects to ship the cards in July, while competitors are targeting fall

Since the PS/2 Model 30 features the IBM Personal Computer AT bus existing

said users are already adding Model 30s to their PC networks.

The IBM announces greater impact on third-party network software, requiring major rewrites to run under OS/2 some of these wenders when

ted. The changes required to support MS-DOS 3.3 are relatively minor, said Mike Pflaumer, a vice-president with Centram Systems West, Inc. in Berkeley, Calif. MS-DOS-oriented vendors said they wif license Microsoft's OS/2. These ven dors include 3Com Corp. in Santa Clara, Calif., Torus Systems, Inc. in Redwood

City, Calif., and Nestar, "We will stay standard with DOS and whatever Microsoft releases," Nestar's Hart said.

Conversely, vendors with a stronger proprietary bent, such as Noveli, Inc. in Orem, Utah, and Banyan Systems, Inc. in Westboro, Mass., have indicated they will probably emulate OS/2. Excelan, Inc. in San Jose, Cald., will write whatever drivers are necessary, but sees no need to li-cense OS/2, said Marketing Vice-Presidem Subbash Ball

It is unclear which group will have a more difficult time adapting to OS/2 those who steadfastly stand by MS-DOS or those who skirt the operating system The vendors outlined their plans as fol

 Novell ann ord Advanced Netware support for MS-DOS 3.3 and the new To ken-Ring and PC Network adapters. It will connect (160) and Extended (160) Advanced Netware Versions 2.0a and 86 currently support the PS/2 line as network nodes. Version 2.1 will provide file

erver support. 3Com will beense Microsoft's OS/2 and LAN Manager, Instally, 3Com will re vamp only its Ethernet cards. As for the diskless 3Station, "It doesn't have the wrong bus or slots," 3Com Chairman Robert Metcalfe sand Nestar's Hart suggested the initial re lease of its own Token-Ring will be PC

AT-compatible · Excelan will provide intelligent Ethernet controllers for the nucro channel bus and Transmission Control Protocol/Intox net Protocol (TCP/IP) networking soft ware for MS-DOS 3.3, available by year's end. TCP/IP for OS/2 will debut when IBM ships in early 1988. Retrofitted hardware will be out by year's end . Torus faces a major rewrite of Tapes try, its icon-based network operating sys tem, already underway for a year and a half. The revamp will feature OS/2 compatibility and internetworking ability. . Centram also faces a major change in its

network operating system, TOPS, a . Banyan is studying the announcements but will rewrite drivers within the next 30 days to run on the PS/2 Models 40 and 50.

Baby/36 fits 31/2-in, format

SANTA ANA, Calif. - California Software Products, Inc. announced that its Baby/36 software is now available on 315 m. diskettes for the new IBM Personal System/2 computers.

Baby/36 software emulates the open ating system of the IBM System/36 mmcomputer to permit development and ex-ecution of RPG-II programs on IBMcompatible personal computers and local srea networks (LAN), according to the

The company claimed its Baby/36 is fully compatible with the PS/2 line and will run under either IBM's PC-DOS 3.3 or Operating System/2 when available as well as earlier releases of PC-DOS and Microsoft Corp. MS-DOS.

Stand-alone systems range from \$650 or execution-only to \$3,500 for complete RPG-II development and execution systems, while LAN versions run from \$1,500 to \$4,500 plus \$100 per linked



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Rolmphone gives IBM PCs PBX functionality

BY ELISABETH HORWITT

SANTA CLARA, Calif. — Rolm Corn. has announced a voice/data communications add-on product that allows IBM Personal sters to access the functionality of the CBX private branch exchange while running standard communications software packages, company spokesmen re-

cently claimed Released during parent company IBM's recent blatz of Personal System/2ited introductions, the Rolmphone 244PC is said to provide PCs with the same telephone functionality and CBX connections as does Jupiter, Rolm's existing PC phone set add-on But while lupiter is a packaged solution that requires the use of Rolm hardware

and software, the 244PC supports third party communications software that conforms to the popular PC AT intelligentmodern command set, according to Rolm manager of data applications marketing Dennis Haar. Rolm hopes to encourage PC communications software vendors to rite their packages to take advantage of CBX functions through the 244PC in terface, Haar explained. "For example

he said, "Borland International could re-write Sidekick to take advantage of the message-waiting CBX feature." Users can also design their own communications

software to interface with the 244PC The 244PC is also reportedly the first commercial product to support Asynchro-nous Communication Device Interface (ACDI), a feature within IBM's Extended

ACDI is that any application program

ident of whether it is using a terminal

written for the PC can communicate inde

tion Operating System/2 protected-mode op-erating system. "The rationale behind

[LAN] interface or the CBX, ." rlaar said. For example, you can use IBM's existing Asynchronous Communications Server to ltnk a CBX to a Token-Ring LAN, and then a PC application written for ACDI can communicate across that connec

Rolm group product manager Am Beitharz commented, "The idea of ACDI is that an application does not have to be rewritten each tune a new communications protocol such as Integrated Ser vices Digital Network, emerges

Rolmphone 244PC reportedly plugs in to a standard PC asynchronous port connection without any special hardware. Priced at \$695, it is scheduled for release in lune, the vendor said



Banyan gears up for marketing

BY PATRICIA KEEFE

WESTBORO, Mass. - With an eye toward the next stage of its growth. Banvan Systems, Inc. has named Richard Meise as president and chief operating officer. Meise, formerly senior vice-president and chief marketing officer at Convergent

Techologies, Inc., will report to Banyan Chief Executive Officer and Chairman David Mahoney. Meise's hire completes the formation of the network systems vendor's unper

management team, which will attempt to move Banyan away from its status as a technology company to a more marketonented posture We want to leverage off the product

we've spent 3½ years developing and proving. We think [Vines network softwarel has a great deal of marketability Mahoney said.

Banyan also promoted James Alichin to vice-president of reseach and develop ment. Allchin was formerly vice-president of software engineering

Strengthening sales and support
A top goal for Banyan this year is to triple rts 1986 sales figures, Mahoney said. But the first order of business this year is to strengthen all channels of distribution, in cluding direct sales and customer support relationships, Mahoney said.

"Our next stage of growth requires that we build a strong worldwide sales and support organization and expand our business through all channels," Mahoney explained. "Dick [Meise's] overall strength is sales and marketing

These plans should bring about a better focus on and understanding of eaduwr needs. Mahoney said, prom ter teamwork between Banyan and its A tighter coupling of direct and indi-

rect sales efforts should result in better service and more timely support for Banyan users, he added On the product side, Mahoney acknowledged the company has Intel Corp. 80386-based products "in the works in-

ternally." but declined to be specific ICW. Ian 261 We're taking a hard look now at what

IBM has to offer, and we'll look at other 386 products on the market before finalizing our 386 strategy," he said.

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Vendors

FROM PAGE 43 protocols incorporated into the The International Standards

Organization has been in existence for many years and is still embroiled in political turmoil brought on by vendor arguments," another Eastern manu-facturer told Forrester, "Too many versions of the OSI standard evolve, and it consequently becomes useless from any practical standpoint

Vendors want to take control of standards development, to add bells and whotles that will give a proprietary edge agreed Anthony Friscia, president of Chicago-based consulting

company Advanced Manufacture

ing Research. Friscia recalled an Institute of Electrical and Electronics Engineers, Inc. meeting several years back when IBM "ran in and out a wall up to stop Ethernet from becoming the only locallarea network standard and

opened the way for the Token-MAP, too, has turned into a focus for vendor power plays, according to Doane Perry, senior telecommunications consultant for International Data Corp.

(IDC) in Framingham, Mass. "MAP standards are con on strong, but vendors like Dur tal Equipment Corp. are begin-ning to kick and scream," Perry "DEC sees a key strategy of delivering high functionality through proprietary products

which are internally coherent." (See story page 43.) In contrast, MAP is generating strong support from compa nies like Data General Corp.

who hope that if they can drive MAP, they will cut into the Decnet market." Frisca observed.

Users don't see payback The problem is that while ven dors clearly see the payback for standards involvement, "investing in standards development will not directly impact the bottom line for a company whose business is building tractors or automobiles." Friscia said. 'General Motors spent a lot of

time and money on MAP, but have they made any money on it? No. But [MAP networking ven doel Concord Data Systems Inc. However, this wait-and-see

attitude denies users the chance to make sure their own needs are addressed by the emerging standard, pointed out James Rothenberger, manager of com tions planning at Carter Hawley Hale Stores, Inc 's data center in Anabern, Calif.

Carter Hawley is currently the only company to send a repentative to the General Inter est Group of the T1 Committee which is largely responsible for determining standard interfaces between customer premise equipment and carner services. which eventually could become

part of ISDN. Unfortunately, participat in a standards group means sending a technically savvy manager whose time is expensive — to periodic meetings that are often held on the other side of the

This commitment of staff reurces can only be mounted by certain was organization IDC's Perry observed

ser organizations such as the Telecommunications

tion, the International Communications Association and the Communications Manager Assocustion can get around this limitation by sharing the cost of representation among all members groups have hired legal counsels.

to represent their needs on regulators issues to the Federal Communications Commission, they have yet to become involved with standards organizations Perry said

'It's still the condors who care about the standards going their way." he added

Net costs

FROM PAGE 43 of user education. Ferms said

For example, in studies track ing the total three-year cost of 40- and 100-node networks. Ferrin found that systems management created the biggest expense, ranging from 38% to 48% of the total cost. Unproductive user time contrib uted 17% to 28% of the cost factor, while training took from 17% to 24% Conversely, hard ware and software installation amounted to no more than 9% during three years

Without these hidden costs, a five-node LAN typically costs about \$13,000, while 40- to 100-PC networks cost about \$70,000 and \$150,000, respectively, he said. When the hidden

costs are included, the real costs expand tenfold, Ferris claimed. He estimated that the total cost for three years usually amounts to about \$150,000 for a freenode LAN, \$800,000 for a 40node LAN and \$2 million for a 100-node network. Ferris based these figures on his experiences with selling and installing LANs in a wide variety of Fortune

While users often recognize the value of LAN technology. they tend to overlook the associ "people costs," he said. "Due to the size of the three vear investment, it's imperative that departmental management be, one more involved in the decisson-making . . . Most of my clients are wise to install a LAN, but it is financial suicide to make the decision based on the cost of the hardware alone," he added

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Users boo

don't like tha

Furthermore, users say, Olsen's comments come at a particularly had time. because the MAP movement has recently lost some of the tremendous momentum it had a year agn. The full to primarily atinshuled to the fact that the MAP 3.0 specifications is behind schedule; MAP 3.0 specifications in the product are not a feat at intributed to the reported for at least onproducts are not expected for a feat at an orpoduct are not expected for a feat at an and hecuse of the cloud of the same and company carry, many users say they feel has comments could damage their efforts to make MAP the factory networking

"He's taking advantage of the state of MAP now, because it's going slower than anxicipated," says Stephen Hagan, manager of automation engineering at an NCR Corp. plant in Wichita, Kani, where a MAP pulst project is underway. "I think this is a power play put on by DEC." THERNET is like hitchhiking, and broadband is like taking a bus. By taking the bus, you have a set schedule to work with. With hitchhiking, you might get a ride immediately or you might have to wait for days."

WILLIAM GEIBEL KAISER ALUMINUM & CHEMICAL CORP

Olsen has been quietly raising objections to MAP for at least a year. But recently, when DEC introduced a series of factory products, Olsen used the occasion to go public with his opinions. "Why another network? We've already got Ethernet." Olsen stud. He quickly followed up with a second MAP attack a week larer.

with a second MAP attack a week later during his keynote address at the ADAPSO Management Conference in Orlando, Fla. "What's confusing is that DEC is always at the user group meetings touting MAP." NCR's Hagan says. "If a user is on the fence about MAP right now, hearing

the head of a company like DEC say those things might make [him] back away." Users also claim Ofsen's statement that Ethernet is sufficient for the factory environment is simply not true.

"Decreet is a good solution, but I've yet to see a programmable controller with an interface to it," says Daniel Miklovic, MAP project manager at Weyerhaeuser Co. in Tacoma, Wash.

Other users raise the issue of precision tuning — which, they say, can be achieved with IEEE 802.4 broadband networks but not with Ethernet. "Ethernet is not good on the cell-controller level." says a systems engineer at a Midwest manufacturer who requested anonymity. "The advantage to brossband cabing is that you can determine the time of response. With Ethernet, it's a random type of thing. You can't predict the performance — and predetermined liming in factors operations can be a very more-

tant thang."

Sasser's Gerbet also rarses this issue.
"Ethernet is like hitchbliding, and broadband is like taking a bus," he says. "By taking the bus, you have a set schedule to work with. With hitchbliking, you might get a nole unmediately or you might have to wait for easys."

"DEC has put a lot of time and money into Ethernet." Getbel adds. "Maybe they feel they're big enough to sway the market. But that's a gamble. I'm not swayed by Ethernet." "Ken (Oisen has) gotten a hell of a lot of

"Ken [Olsen has] gotten a hell of a lot of publicity from this," concludes Weyerhæuser's Miklono. "That's shrewd marketing. If he were lining up in support of MAP, he wouldn't get any coverage."

LAN battle

CONTINUED FROM PAGE 43 particular the redirector portion — is the base on which a number of network

vendors, including Novell rival SCom Corp. have built their network operating systems. These vendors are committed to following the DOS standard and, most likely, any networking standard set by Microsoft. Conversely, vendors such as Novell

Conversely, vendors such as Novell and competitor Banyan Systems, Inc replace DOS with software that emilates DOS, at the same time overriding the liabilities of the single-user operating system.

At stake in this battle nitially are software applications. Will applications be written to the proprietary Netware standard, for example, or to the DOS standard? Novell already has a head start in this area by virtue of being first into the

UNIX

end users will soon follow the path chosen by applications developers.

Long way to go

Despite support from some sectors of the networking market — including IBM which uses MS-Net as a base for its PC Network Program — Microsoft has a lot of catching up to do before it overtakes IBM, never mind Novell. Attendees at a recent Microsoft half-

market. The hearts and pockethooks of

Attendees at a recent Microsoft halfday seminar that detailed the new operating system and peripheral software found that Microsoft has focused most of its energies on protected-mode DOS, as opposed to its LAN Manager.

Microsoft is looking at the LAN Manager as part of an Intel Corp. 80286based operating system posteroned as the standard platform in the PC LAN market, according to Robert Clarke, an anatyst with the Seybold Group in San Jose. Cald.

Unfortunately, Novell and even Microsoft's close OEM, SCom, already bave 80/286-based network software on the market and should be well on their way to releasing Intel 80/386 versions before Microsoft even gets its protected-mode 80/286-based DOS out the door.

Microsoft not for olong Mon. Mercosoft jormines to The laster and more flexible," were made in regard to MS. Net and don't appear to include plant to offer more features to the compary's older version. In a sense, Microsoft is talking about competing with saed here. Meanwhile, by the time Microsoft is ready to earth up, Norell will have been sense. The sense was a month with an Soldie product and a disk lase server. Clarke predicts.

saying, "This is what the LAN Manager will do," but they aren't very far along," Clarke says, adding that Microsoft has not decided whether to put communications into its LAN Manager or DOS. IBM, of course, has already decided to put a let of communications into its somewhat proprietary Operating System/2 Extended and is not likely to share that technology with Microsoft or anyone else.

IBM and Microsoft is do differ in their

and when the state of the state

from file service as it moves into Systems Application Architecture, Clarke says. The reason we're talking about IBM here, and not Novell, is that Novell, Banyan and others will follow the standard as set by IBM — not Microsoft.

Rude owekening ahead? Clearly, Microsoft is facing an uphill battle. Clarke is not alone when he suggests that "Microsoft will not be the champoothey think they are going to be" in the net work software market. But don't think Novell is heading for a

TKO. Wasic competitors agree that Nevel has done a good plo of fulfilling a need in the low end of the market and has beenfielded until now from its close relationship with BMs. they doubt that corporate America will see Netware as the answer to its standards prayers. Microsoft has an uron groe on the Fortune 1,000 deak top, and company devotees are more tens weed to take a Digital Engineers.

Meanwhile, the prefight hype keeps building. Will Novell get respect from the corporate decision makers? Can Microsoft leverage its relationship with software developers to transition, along with its users, from the single-user to multiuser world? Stav tused.

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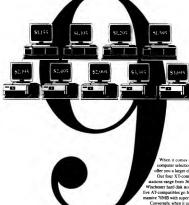
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Local-area network

Itron, a division of Informs Soula Corp., has announced the Commix 32. an intelligent table-top data switch for local-area communications and peripheral

The Commix 32 is said to allow any personal computer user to access any oth er PC, peripheral or host computer port using serial communications software. From a PC or terminal. Commix 32 can be accessed using the AT modem protocol for connection request. Asynchronous

ъ. U C format conversion is provided

R 0

> Commix 32 is offered in an initial 16 channel configuration and can be upgraded in four-channel increments up to 32

Commix 32 is priced from \$2,595 Itron. Building 116, 130 Gatther Drive, Mt. Laurel, N.J. 08054

Comware International has announced Comgate, a communica front-end processor for the IBM Sys-

tem/36 and 38. Comgate is said to use IBM Personal Computer AT hardware to link the System/36 and 38 computers with local-area

T 5

networks, public data networks and direct-dul networks. Un to 16 perioberals may simultaneously access the minicomputer via Comgate.

Compate provides direct atta to public data networks via the CCITT X.25 standard. Up to two X.25 interfaces may be connected to a single Comgate; up to 16 ports of simultaneous access are

supported Comgate is priced from \$9.500. Comware International, 3477 Rancho View Court, San Jose, Calif. 95132

Local-area network software

Fastcomm Systems, Inc. has an-nounced Decemm Link a communica-

tions program said to link data from remote devices and services with personal computer data base management pack-

The program allows data from any device that uses a standard RS-232C serial port to be captured and dissemenated to multiple external ports. Support is proyield for time-of-day activation tracing and debugging aids and a communications macro language.

Domm Link works with Ashtor Tate's Dhase III Plus. Nantucket, Inc.'s Clipper, Quicksilver Software, Inc.'s Quicksilver and Fox Software, Inc.'s Foxhase Plus. It runs on IBM Personal Com-

Domm Link costs \$295. Fastcomm Systems, 235 Carrol Canal Venice, Cald. 90291.

Customer-premise equipment

Brooktrout Technology, Inc. has announced its Fax-Mail family of commune cation systems for linking personal computers and facsimile machines.

Fax-Mail systems plug into any IBM Personal Computer or compatible and al-low PCs and facsimile machines to communicate worldwide over standard telephone lines. According to the vendor, the facsamile machine can accept both text and graphics unages from the PC. Files can be sent to different printers or be dis played on graphics monitors. Data can be input directly from certain scanners into the PC for transmission Other features include automatic

transmit and receive a dol directory or automatic dailing; and the capability to store, forward and edit documents.

Fax-Mail is priced from \$595 rooktrout Technology, 110 Cedar St., Wellesley Hills, Mass. 02181.

Metaphor Computer Systems has an

nounced the SQL/DS Gateway, said to allow users of Metaphor's information retrieval and analysis system to access and analyze data that resides in IBM's SQL Data System (DS). The SQL/DS Gateway is a dedicated

ocessor that serves as a bridge between Metaphor workstations and an IBM-com patible processor running the VM operat-The SQL/DS Gateway is priced from

Metaphor Computer Systems, 1965 Charleston Road, Mountain View, Calif

Modems/multiplexers

nounced the AJ 9601-ST V.29 modern. The modern was designed for point-topoint or multipoint use. It provides fullduplex synchronous operation at 9.6K over four-wire, unconditioned leased lines. It features an automatic adaptive equalizer, front-panel programmable options and a continuous front pan el numeric signal-quality display. Un to 15 modems can be supported on

a single line, and each slave in a multipoint network can be addressed individually from the master for down-line loading of option setting or for testing.
The AI 9601-ST rosts \$1.295

Anderson Jacobson, 521 Charcot Ave. San Jose, Calif. 95131.



They're all talking about the IBX* the first integrated voice/ data switching system The IBX(Integrated Business

Exchange) is proven, leading edge technology. It gives users a unified network for the sharing of hosts, voice and data devices, and applications. Already it's become the communications core for compantes and organizations like PPG Industries, Monsanto, Union Bank, Air Products and Chemi cals. Inc. and Lehigh University

No matter what computer system you're using, no matter what information you need, the IBX can improve your communications network at every level For a customized demonstra

tion, or for more information on the IBX and other InteCom products, call 1-800-INTE-800. In Texas, 214-727-9141, ext. 2661. The Formula for Integration.

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SYSTEMS & PERIPHERALS



Info system chauvinists

By itself, no single facet accounts entirely for a diamond's beauty and worth. On the contracy each part contributes equally to the whole. If one component could somehow be removed, the result would be a

completely different stone The same principle applies to business information process-

my. Each level in the processor hierarchy - mainframes, departmental computers and personal computers - plays a role for which the other two are mherently ill-suited. Take away and one element and the sys tems organism of which it formed a part changes radically and loses much of its ability to

Yet those who define their professional identities in terms of one class of bandware or another act as if the opposite were

Even worse, they declare their allegiances unthinkingly, in the manner of an article of faith or indisputable universal truth

One instructive way of looking

at the information systems field is to divide it into two camps Anyone even passingly familiar with computing can easily think of individuals who exemplify On one side stand the per-

sonal computer bigots. For than an IBM Personal Computer AT qualifies as a technological dinosaur unworthy of serious attention. Their snobbery ever refracts their sense of the past As viewed through the eyes of a personal computer bigot, modern history began with the introduction of the original IBM PC ancient history, with the advent of the Apple Computer, Inc. Apple I: and prehistory with Heathlet and Mits/Altair

In short, like latter-day Ptolemoes, the members of this brash and cocksure group see themselves and their own little

world as the center around Continued on page 64

Wang unleashes Tempests BY NINAMARY BUBA MAGINNIS

LOWELL, Mass. - Wang Laboratones, Inc. has added two 32bit minicomputers to its Tem pest product line with the appointment of source ver-

sions of its 1-year-old VS 5 and VS 6 systems The entry-level VS 5T and VS 6T are competible with all VS software and peripherals, ac cording to the vendor Tempest equipment

unned to comply with U.S. National Security Agency regulations, is targeted at users in

sensitive information processing The new Wang systems in-

bytes of external disk storage and development software supand four data communication port, networking and comm

cations and the ability to process data, text, voice and images in-teractively. Wang said. The VS 5T and VS 6T systems do not require any special housing and can be installed in ves. The VS 6T, list priced at offices without special

power or air-conditioning re-\$21,500, is said to support up to quirements. Wang said.
The VS 5T CPU is said to 16 users and 24 peripherals. The VS 6T uncludes 16K support up to eight users and 16

bytes of cache memory for faster processing and provides the power of Wang's mid-range Tempest VS 65T in a small sysing system. 1M byte of memory; tem, according to the vendor a 514-in., 1.2M-byte diskette Options include up to 4M ties for attaching up to 1.7G Continued on page 56

doubled on some VAXs VS 5T options include an additional 1M byte of memory and support for up to eight disk drives per system, including MARLBORO, Mass. - Digital 75M- and 288M-byte removable

Equipment Corp has doubled the memory capacity of its VAX 8600 and VAX 8650 superminscomputers with the introduction of a higher density mercury at The MS86-DA was designed

Memory

to increase memory capacity for the 8600 and 8650 from 68M bytes to 128M bytes. The comnany said the arrays are intended to provide better support for memory-imensive applications such as artificial intelligence computer-aided design simula scientific modeling and large commercial data base management systems. The arrays are supported under DEC VMS Versinn 4.5 and console diag tic pack Version 3.0 and DEC UI

The array uses 1M-base dinic random-access memory thins moutted on a subassem his Javani configuration using a process. The company said installation of the array requires no hardware changes or modifi

The MS86 DA has a one-year warranty, is available now and mere \$36,000

UPDATE Storage options confusing

riced at \$13,500, the sys-

tem includes Wang's VS operat

drive: 1/O controllers and facil-

peripheral devices

BY JAMES CONNOLLY

he popularity of highly interactive applications has hardware vendors scrambling to provide the needed memory and storage But the demand by memory-hungry applications and the competing vendor options leave some mainframe users in a quandary Interviews with MIS managers recently

unveiled a sense of confusion in how to us the features and products offered by IBM and competing plug-compatible manufacturers (PCM). At the heart of the situation is IBM's expanded-storage feature, offered as a key advantage of the IBM 3090 mainframe over the older IBM 3080. The confusion stems from how to utilize

expanded storage, with which users still are Continued on page 63



Intel adds low end to scientific line

BY JAMES CONNOLLY

BEAVERTON, Ore. - Intel Scientific Computers, the division of Intel Corn, that sells bypercubal-based scientific sys tems, has added an entry-level workstation to that product line

The Sugarcube, which is available in four desktop-size models, was designed to be software-compatible with Intel's IPSC hybercube parallel proces-The four models include a

standard system for concurrent computing research, an extend-

mory system with up to 18M bytes of memory for artificial intelligence and symbolic computing applications, a high numeric-intensive applications and a hybrid version that combines numeric and symbolic ca pabilities within a single system

Sugarcube systems will speed the commercialization of concurrent computing technology by expanding the number of indu trial applications developers. In addition, as these turnkey applications are developed, the Sugarcube will be the ideal criscur computing engine for

OEMs," said Charlie Bishop Intel's marketing manager He said an application developed on a Sugarcube with four processing nodes could be scaled to run on the larger 16: 32- or 64-node IPSC-VX systems for

Sugarcube and IPSC systems support from four to 128 nodes with each node including an Intel 80286-based single-board com-

A four-node Sugarcube-VX vector system reportedly performs 26 million Boating-noini

· CIE Systems offers 25-MHz Motorola 68020 up

grade board. Page 58. . EMC appoinces memor upgrades for Wang super minis. Page 64 Megatek adds 3-D graph ics display Page 66

The Sugar, ube to slated to be available in July. The standard Sugarcube D3 system costs \$45,950 The lour-node of l-memors Sugarcube-MX/D2 hts \$49.950. The Sugarcube-VX/D2 with four vector nodes nts \$69 950

In a related announcement Intel introduced an enhanced concurrent operating environ new shipments of the IPSC fam

he faster than previous versions and to add a concurrent debug ger, multiple user access, con and support for hybrid IPSC -15

to the vendor

Minisuper software out

Floating Point release allows file striping, IBM support

BEAVERTON, Ore - Floating Point Systems, Inc. recently began offering a new release of operating software for its M64 series of minisupercomputers.

The release, SJE Version G, is availfor the M64/40, M64/50, M64/60. M64/140 and M64/145 machines Specific improvements include file ad-state semiconductor mass storage subsystem, 16 new math routines and 198

naturated math routines.

File striping enables a user to autom striping, software to support the FPS P64/40 disk subsystem and P64/110 sol-

MVS/SP and MVS/XA operating sysically read and write multiple disk controlers in parallel. The various models of the FPS M64 series can be configured with as many as six disk controllers, with each controller handling up to four disk drives Floating Point also announced its FPS/VAXBI Interface Package for both its array processor lines, the MP32 and

standard-label tapes under IBM's

FPS-5000 senes. The interface, making use of the VAXBI architecture, transfers data at up

to 10M bit/sec The interface package was designed for use with all Digital Equipment Corp. VAXBI processors, from the VAX 8200 to the VAX 8800. Floating Point said the

interface will be available in late summer. in addition, Floating Point Systems introduced MPFortran, a high-level cross-compiler from a VAX to a Floating Point MP32 series-array processor. Based on Fortran 77. MPFortran will let systems designers develop high-performance applications using standard Fortran staterents, and should make the MP32 casser and more cost-effective to use, according

Departmental integrator's machine bows

BY STANLEY GIBSON

NEW YORK - Motorola, Inc. recently unveiled its Model 2616 departmental computer designed for systems integrators The 32-bit system is part of Motorola's VME Delta series, which incorporates the VMEbus, Motorola 68020 microprocessors and AT&T Unix System

V. Release 3 operating system The 2616 is currently the only OEM/system integrator product that combines VMEbus, 32-bit speed and Unix System V, Release 3," claimed Noel Lesniak, systems products manager for Mo-

torola's microcomputer division. The departmental processor, with a 12-slot VMEbus chasses, offers disk ca pacity of up to 1.3G bytes and can support

up to 34 years, the sendor end The Model 2616 is available for immeate order and delivery. It is priced from \$14,000 to \$25,000 in OEM quantities also introduced MVSB2400, a low-power user-program

mable bipolar large-scale integration gate array said to allow VME board designers to support the VME Subsystem Bus while reducing board space requirements by 20%. The VME Subsystem Bus is a local path over which processor, memory and peripheral control modules communicate reduce bus traffic. Priced at \$300, the MVSB2400 will be available in July.

Three boards premier

Motorola also introduced three beards designed for multiprocessing use the MVME135, the MVME135-1 and the MVME136, all of which use the MVSB2400 gate array. The boards use

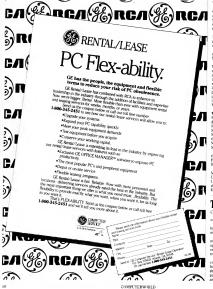
the MC68020 microprocessor at 16 or 20 MHz and the MC6881 Floating Point Math Coprocessor The MVME135, the MVME136 and the MVME135-1 are available now Prices in quantities of 100 are \$3,934

\$4,256 and \$4,256, respectively In addition, Motornia introduced the MVME134, a single-board computer for Unix applications that incorporates the 16.67-MHz MC68020 processor. Available in June, the MVME134 is priced at \$2,250 for an OEM monthly of 100

The VS 5T can be upgraded to the 6T by replacing the C. 'U board and adding a Wang also announced a 44-m stream-

on small computer systems interface The disk drives are said to provide in creased security, greater capacity and faster throughput. The cartridge tape drive costs \$4,000 and the disk drives are





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Board allows upgrade to 25 MHz

IRVINE, Cald - CIE Systems. Inc., a subsidiary of C. Itoh Electronics, Inc., has introduced a kit surred to upgrade its CIES/680 series of multiuser

business systems to 25 MHz. The Turbo/25 CPU board re portedly allows a retrofit of existing CIES/680 computers or can be configured into a system noing the company's CIFS Pick or RM/COS

According to the company there is no need for modification

of users' existing application The Turbo/25, which is built on a 25-MHz Motorola, Inc.

68020 microprocessor, is said to have the ability to provide throughput and performance gams ranging from 50% to 125% when it is installed in a CIES/680 using an Intel Corp. local bus-exarchitecture tension memory that has either a 10-MHz Motorola 68000 or a 16.7-MHz

"Our dealers can not only configure a C. Itoh system with disk, memory and ports to match an application, they can now select from several processors to optimize performance," claimed Warren Blossom.

Blossom is vice-president of Itoh's computer systems The Turbo/25 is scheduled for availability in July. It report-

\$13 995

tional, Inc., a manufacturer of 32-bit multiuser systems, has operating system - Pick Systems, Inc.'s Pick - for its MPS020

The MPS020 reportedly now provides concurrent support for to provide concurrent sup

Park which is front's turnion of In addition, the product is said edly will carry a price tag of for Microsoft Corp.'s MS-DOS

OREM, Utah - Icon Interna

ounced a third concurrent

The MPS020 is a family of parallel processing computers that feature a minimum of three Motorola, Inc. 68020 micro-

processors, according to the Icon claimed the MPS020

processes up to three million instructions per second. The company said the system architecture allows all three operating systems to run concurrently while sharing resources such as disk drives, printers and terminals

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Masscomp adds CPU support

WESTFORD, Mass. - Adding support for additional CPUs and floating-point accelerator. Masscomp has enhanced its 5000 family of scientific comput-

its MC5600 system now sup-ports a third CPU. In addition. the MC5600 and MC5550 now support an Intel Corp. multibus expander box, have a 15-slot option with power supply enhance ments, the company's FPA-2 Lightning Floating Point Accelerator and a choice of data acquisition modules

Masscomp also announced a Disk Performance Accelerator, which was designed to allow 278M-byte disks to run at 2M byte/sec. within a cylinder, and new versions of its Data Acquise tion Control Software

The company also said third party software recently ported to the 5000 family includes Verdix Corp.'s Verdix Ada Development System and Franz, Inc.'s Extended Common Lisp.

Drive ups DEC security

MILPITAS, Calif. - Systems Industries, Inc., a third-party supplier of Digital Equipment Corp.-compatible peripherals, has introduced a small-form-fac tor disk drive designed to be removed to secure places such as vaults and coheners

The Quick Disconnect Sys cm is targeted at DEC sites dealing with sensitive data. The drives are available in a 5%-in. package with 320M bytes of formatted capacity

The drive is slated to be work able this month. A two-drive sys tem in a 19-in, rack ranges from \$16.400 to \$19.400

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The improvements



Introducing the new 12-MHz COMPAQ DESKPRO 286. 50% faster, 100% Compaq.

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And so you won't lose compatibility, we pioneered dual-speed processing, which reduces speed from 12 to 8 MHz in the few cases it's needed.

Compaq also maintains hardware compatibility with 8-MHz expansion slots that let you use industry-standard expansion boards, moderns and add-ons without sacrificing your 12-MHz speed.

Hidden assets

While many manufacturers cripple high-speed processors with low-speed RAM, Compaq gives you up to 2.1 Megabytes of 12-MHz RAM on the system board without using an expansion slot,

8.1 Megabytes using only three. Speed is also boosted by high-performance 20-, 40- or 70-Megabyte fixed disk drives with some of

are out of sight



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the industry's fastest access times. And to protect data, we offer an internal 40-Megabyte fixed disk drive backup system, another innovation.

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display options than any other PC in its class. The COMPAQ Dual-Mode Monitor displays both high-resolution test and graphics. And the COMPAQ Color Monitor and COMPAQ Enhanced Color Graphics Board support EGA and CGA standards, displaying 16 colors at once from a palette of 64.

You get more expandability too—with seven available full-height expansion slots and room for four internal half-height storage devices, including 1.2-Megabyte or 360-Kbyte diskette drives.

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Our improvements may be hidden, but they're clearly apparent in superior performance. That's why the most demanding users prefer Compaq. And why we can offer a full-year limited warranty. Seeing is believing. For the location of your nearest Authorized COMPAQ Computer Dealer. or for a free brockner, cell 18-80-23-16-900, operator 20. In Canada, 416-449-8741, operator 20.



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Storage FROM PAGE 45

experimenting, and how the 2year-old ontion will develop in relation to IBM offerings such as cache controllers. At the same time, the PCMs are answering with their own memory/expand ed-storage/cache combinations and with repositioned solid-state storage devices that were once

intended for work loads now handled in expanded storage We are just watching to see what IBM will do with it. We see it right now as a possible name device that we might need som where down the road, but not yet. We really just haven't had the high paging need so far, says Howard Campter, director

for Ashland Oil, Inc.'s data cenn Lexington, Ky. Michael Sims, vice-preside of information systems at Conrail in Philadelphia, adds, "The problem most people must look at is what they can do with exnanded storage without understanding what IBM is going to do with the operating system.

Expects new version s, who runs a major CICS ap-

phration on an IBM 3090 Model 200 with expanded storage, says, he expects a new version of IBM MVS/XA in 1988 or 1989, He says the version, due about the time Contail plans to make its next major hardware decision, might shift tasks from I/O devices to the operating system and rice versa. For example, whether was such as managing shadow files run in memory could be a key as users decide whether they need expanded

rage. Sims explain However, IBM officials say they find no confusion. "I deal with lots of costomers, and they Those customers who have it installed on their 3090s are realizing significant benefits. Those customers who do not yet have it talled no their 3090s are looking at expanded storage and the recent software appouncements for their specific applications enassa Ismas Hill manager of data systems support for IBM's Information Syss and Storage Group

IBM introduced expand rage with the 3090s in 1985 The company has enhanced the feature several times by increasing its capacity and extending it to lower end 3090 models. Expanded storage is a config-

uration of 1M-bit chips tied to memory - what IBM calls cen tral storage - by the system The 3090s support 32M bytes to 256M bytes of memory Users can add expanded storage ranging from 128M bytes on the low-end Model 150E to 1G byte on the Models 400E and 600E PCMs Amdahl Corp. and Na

l Advanced Systems Corp (NAS) offer their own vers

ni expanded storage Amdahl ions portions of up to 512M bytes of main memory in its 5890 mainframes as expanded storage. NAS says at will offer main memories of 2G bytes in AS/XI mainframes by year's end

and 1.9G bytes of expanded storage by mid-year Amdahl, NAS and peripherals ndors Memorex Corp., Intel Corp. and Storage Technology Corp. also market cold-state storage devices. Those devices are hoves of memory chins con-



nected to CPUs through I/O channels and usually equipped with battery and disk backups. The devices on the market for so years, emulate IBM 3380 disks but have much faster access times because of the advantages of electronic storage over mechanical devices. Solid-state storage device capacities range up to 2G byzes

Only expanded storage But IBM elected to affer only ex-

panded storage. "Expanded storage was chosen for several reasons. Price and performance junction with growth and a balanced systems offering. The larger processor storage sizes that are possible with expanded storage allow us to provide per formance similar to larger cen tral storage at better price/per "IBM's Hill says

IBM charges \$405,000 for 64M bytes of expanded storage and \$540,000 for 64M bytes for central storage ungrades In contrasting the perfor nance of expanded storage with

I/O devices, whether cache con rollers or the PCM solid-state storage devices. IBM senior pro ammer Gary King observes When a user references a page on an I/O dennce, it takes about 30 milliseconds to get it into the processor's both-speed cache to be used. With expanded storage, it takes 75 microseconds to get it cache; and that is much,

much faster King says some customers realizing the greatest benefits from expanded storage are those in environments with large numhers of address snares, such as IBM's MVS/TSO, VM/CMS and Cadam; those with large virtualaddress requirements, such as engineering applications; and

those with multiple sub including IBM's IMS and CICS Most customers report they use expanded storage for paging - brancing AK-bote blocks of an structions into the CPU to avoid

frequent accesses to disk or cache controllers. Tack Knowlton anager for Alhed-Signal Ben dix Test Systems in Teterboro. N.J., reports, "We are using it for its designed intent, which was name. We were regime at

500 to 600 page/sec, and it real ly was choking our I/O subsystem at a time when we were bringing up some production IDMS systems. We installed a Model 200 in October 1985 and have never seen the rate for local

devices guabove 1 page/sec. Knowlton says his company. which runs Cultinet Software, Inc.'s IDMS data base man nt system, has a Model 200 with 64M bytes of memory and

128Mbytes of expanded storage that soon will be upgraded to a 3090 Model 400E with an addbonal 128M bytes of expanded storage Conrad's Sums says his orga nization has expanded storage on a Model 200 running a constant-

ly updated CICS application tracking movement of freight cars throughout the railroad system "It's a bush transaction processing application, which we have tried to keep sensitive to response times," he says. "Base cally, we have it because the apobcation we are running is rath large, and it is all co-resident. It

against them.' reports Steve Josselyn, an analyst specializing in user issues with In ternational Data Corp. (IDC), a Framingham, Mass based mar-ket research firm. But IRM's growth of expanded storage has eased those concerns, he adds.

Dave Mitchell, manager of inputer operations for Chevron Corp. in San Ramon, Cald reports his company has used Storage Technology and NAS solid-state storage devices for names and swammer under VM and MVS for several years. Now evron also does VM paging on a Model 200 with 128M bytes of expanded storage

Mitchell says of the devices We are doing paging and swapping, so there is no updatable data. It is strictly used by the onerating system.

Another manager observer that he uses a solid-state storage device for application files and paging, "We are kind of atypical in that we do use some of it for naging but we use the majority of it for application files," says Ed Frazier, vice-president of data center support for Dallassed Chilton Corp.

Chilton has used Memorex solid-state storage devices for several years. "We are a plug-compatible mainframe shop with Amdahl hosts and mostly Me morex peripherals. Amdahl makes available more memori that you can partition as expand storage. However, baven't chosen to go that way Frazier says. By placing two I/O-

intension disk files on the de-

vices. Chilton improved the task-

residency time - the time from

when a transaction enters the

system until it exits - by 40%.

But he warns solid-state stor

age devices are not meant for ex-

ervone "Quite frankly, you have

high access rate. Folks heavily

A spokesman for Amdahl re-

ports the company is offering

which Amdahl calls Electronic

Direct Access Storage (EDAS)

products where battery backup

Dennis Stein, director of pro-

Amdahl, cites the example of lin-

sor system marketing for

solid-state storage devices

is important.

from half a second to three

tenths of a second.

ear data sets used for indexes into relational data bases and

other files requiring 'real quick lookupe before hulk data is re-

Stern says the choice of where in main memory, expanded storage, EDAS, cache disk or tape must be based on how the data fits into a hierarchy based on importance and access frepayney. 'In a perfect world, every mece of data would be accessible in an oser. The reality is that from cost and other perspectives, that's not practical he says. Operating system code an present bottlenecks if it is far from the processor. The code belongs in main memory. Stein says, explaining that is a reason

for Anydahl's offernia target

main memones. Tracy Hawkey, solid-state disk product manager for Memorex, says typical uses for a solid-state storage device would be maintaining data base indices, spool files and security files. But he also says Memorra Finds stuelf selling the devices against expanded storage Stein says the advantage of

memory over expanded storage not just the bus speed but also the fact that the path from expanded storage to the CPI is still through main memory

Decision hurt market

Stein also maintains that IBM's on to offer expanded stor age but not solid-state storage devices hurt the device market because the technology lacks IBM's endorsement He adds "I don't think any

body was waiting to reheve all or their problems the day IBM announced expanded storage think, quite frankly, that people don't understand what expanded storage is for IBM is trying to create sort of an aura around exnanded storage, but the reality is that they haven't given you a to use # "

IDC's Insselve says. 'Propie are learning how in use expand ed storage Everyone was in-grained with the mentality, before, of going out to disks

losselva continue "it is hard for IBM to break in with expanded storage. But people who have bought it are using

Hawkey says disk and battery backups on solid-state storage devices are changing the way the PCMs market the boxes. He says, "Storage Technology first to find a noche application. It has to be a volatile application with a offered theirs as a paying alter native Winchester disks and into performance tuning will find an opportunity for a device," he battery backups are helping people to put on soore volatile data

Hawkey says he foresees ca pacities of the devices soaring past the 2G-byte level to 8M hytes as IM-bit clups replace 256K-bd chips. Meanwhile IBM will continue to enhance expanded storage in increments, rather than through major break

throughs, Josselyn predicts Continued on page 64

Competitors' capacities

	Main Memory Objest	Expanded Storage (bytes)	Shrage (byles)
IBM	25656	1G	NA.
National Advanced Systems Corp.	2G	1.9G	2G
Amdahl Corp.	512M	512M	512M

makes sense for us in our specific anolication

An MIS manager who asked not to be identified reports that he uses expanded storage to elminate paging. He says programmers have no involvement in assigning data to expanded storage rather than main memo ry. He also uses Storage Technotions 4305 solidatore storage

devices to support VM paging and IMS load-library management on IBM 3081 mainframes Paging was a role at which the PCMs aimed solid-state storage devices for several years and in which many customers still use the devices. But now the PCMs are redirecting their efforts to-

ward storage of volatile data rather than instructions "One knock against expander storage when it came out was

that it wasn't big enough. That is something Storage Technology

Chauvinists

CONTINUED EROM PAGE 55

ich the rest of the systems universe revolves. Call them microcentric. On the other side stand the mainframe chauvansts. Many MIS executives have made great strides in responding to the profound changes that personal computing have brought to their systems en-

But others have been slow to adap To say that most of the laggards are actively resisting micros is probably an overstatement However neither do they wholeheartedly accept the machines or know how to cope with them effectively Although they may welcome PCs as a

boon to end-user productivity, mainframe chauvirusts also fear the products as a threat to their control. In them churns a secret longing to return to the good old days, when glass-enclosed data centers were the undisputed suns about which all systems activities obediently orbited. Call

nel vision

Abke only in their shared tunnel vision, personal computer bigots and mainframe chauvinists are often woefully ill-in formed about even the basics of each oth ers' domains. But their deficiencies go for hexand simple renorance, which can be readily corrected, given a sufficient willingness to learn.

What makes personal computer big-

ots and mainframe chauvinists so lamen table is their narrowness of mind, their unreasoning belief in the innate superiority of their own specialties and their stubborn refusal to acknowledge virtues

in others different from themselves Like most other forms of prejudice, theirs is a habit that is hard by nature to break. In the early 1980s, when PCs were still a novelty in the corporate world and usually operated independently of the

larger classes of systems, their parochialmight have been understandable. maybe even unavoidable. But today, their attitudes are outmoded and indefensible During the nost few years users and vendors have integrated mainframes and micros to the point where the two are no longer possible to treat individually. Such

is their degree of inseparability that neither side can claim true mastery of its own discipline without gaining at least min-

mal competence in the other But the idea of ambidexterity in infortion systems is utterly foreign to confirmed microcomputer bigots and main frame changings s The plain fact of the matter is that

host processors and desktop machine are merely different facets of the same gemstone known as the information sys tems enterprise. The sooner that small and large systems buffs accept that mescapable truth, the better off the industry - and everyone in it - will be Beeler as a Computersweld West Coast correspon

EMC boosts memory of VS 7000

NATICK, Mass. - EMC Corp. has intro duced memory upgrades for Wang Laboratories, Inc. superminicomputers, in cluding the VS 300 and the recently

ounced VS 7000 serie The upgrades are available in 4M- and 8M-byte increments and utilize 256K-bit memory chips

EMC, which manufactures memory products for superminis and minicomput ers from several vendors, claimed a 25% price advantage over Wang's memory of-EMC's 4M-byte memory board costs \$19,200. The 8M-byte board costs

\$38,400

Storage options

Where IBM's Extended Architecture (XA) allows memory capacities of 2G bytes, expanded storage eventually could provide 16 terabytes of storage because each 4K-byte page in expanded storage uses only one address in memory, IBM's Hill says

But while incremental growth is occuring, users such as Conrail's Sims and Ashland Oil's Campter are watching what IBM is doing to let customers do more with expanded storage In recent months, new versions of

CICS and MVS/XA have taken advantage of expanded storage, IBM officials claim locarion cave that in recent months hancements to IBM products such as

IES2, IES3, VSAM and Data Facility Product have been aimed at utilizing exided storage. He cites the example of a 1986 VSAM release, under which a main frame's paging manager is allowed to han-dle linear VSAM data sets. Sims adds that he expects future open

ating system enhancements to rework the way the CPU reacts with controllers and with storage. He says IBM has moved more functions into memory, which could ean more work for expanded storage. However, he notes that more functions still might be shifted to controllers, which ould mean off-loading tasks from the CPU and expanded storage



In 1981, we introduced the world's most successful personal computer:

Here we go again.

Introducing the IBM Personal System/2





personal computer out the door and hoped you'd find it useful. We're pleased you did. Over three million IBM' PCs have been put to work, doing everything from financial analysis to first-grade arithmetic.

Five years ago, we sent our first

as we kept improving them, one thing became clear. You needed more. You're in a hurry, so you want PCs IBM Proprieter II

Programs are here for the IBM Heronal System 2

So there was only one thing we could do: create a whole new system for personal computing The new IBM Personal System/2. Its heart is a new line of hardware

software and training.

IBM Proprinter 124

You want improved reliability.

soleting your investment in equipment.

And you want all this without ob-

Yet as PCs grew more popular, and and software, but its soul is bigger; new technology, of course, but also a new "balanced system" approach for

making things work

It works with earlier

IBM PCs so your invest-

ment is protected. It

together

to respond faster. You do many things at once and wish your PCs could too. You want software that's

more powerful, but also works with larger IBM easier to use. systems so your future You'd like more color. You're eager for your systems to communicate

growth is protected. It works for business and education, for professionwith other systems. al people of every stripe.

The next generation in

The new systems.

There are four models of the new IBM Personal System/2: Models 30, 50, 60 and 80, with a choice of configurations, with new design and components, and built not merely for speed but for well-balanced performance. cessor, is an even bigger step forward. It has new architecture (as do the even more powerful models) that breaks old barriers. One megabyte of memory is now standard, and there's plenty of room for more. Its graphics (again, in common with the larger models) are



THE PERSON NAMED AND PORT OF



Continue 1

IBM Proceed System (2 Model 30)

Model 30 is about 25% smaller than the IBM PC, does many jobs more than two times faster than the IBM PC XT. and comes with 640kB of menty ory and a 20-megabyte (MB) fixed disk if you want one. Much of what used to be optional is now standard, and improved. Graphics are spectacular. So is the value. Model 30 offers exceptional performance for the money.

Model 50, with its 80286 micropro-

IBM Procesal System /2 Model St

another dimension beyond. And it finishes many jobs significantly faster than the IBM Personal Computer AT

Model 60 takes up less space on your desk because the computer itself doesn't si on your desk, but rather beneath or beside it. Equipped with a 14 or 70MB fived disk up to 15MB of memory and expanded expandability, it's a system for serving a very busy person, and can be a file server for

personal computing.

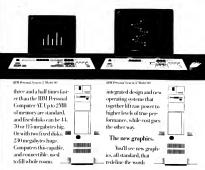
other husy persons.

Model 80. For everyone who's been waiting to experience the real power of the 80386 microprocessor, it's not just in this computer, we built this computer around it. Available this summer. Model 80 is a 32-hit system that does jobs up to

The rest of this booklet tells more about the IBM Personal System/2. And how, all together, it can help make your

professional life easier, more productive, and more rewarding.

The new performance.
You'll find new architecture, new



"colorful" and "sharp." And new displays that give your programs a heightened sense of reality.

The new connectivity. There will be new avenues for sharing information; new match-ups of hardware and software that shorten the distances and widen the roads between PCs, minis, mainframes and people.

The new media.

You'll see rugged diskettes that are

half as big, but hold up to twice as much as floppies did. Plus low-cost devices for transporting your data from one generation into the next. And a new IBM 200MB optical disk drive.

The new solutions. You'll discover new ways to solve problems; ideas about choosing not just software or hardware, but software. hardware and support in balance.

support.

for connecting with large the IBM System 36 and

The new printers. You'll see an expanded family of

IBM Quiencrater III Printer

personal printers that fills just about any need, from economy, to speed, to the fussiest levels of document quality.

The new support. And because it's not just what you

buy but where you buy it, you'll learn how we've been working closely with the people who sell the Personal System/2 to create new levels of dealer

So, it's power you wan

The new performance.

It's tempting to size up computers by the numbers, but in the IBM Personal System/2, real performance exceeds the sum of its parts.

Components were designed not just to coexist, but to cooperate: within each system, and within your total computing environment.



The IBM Personal System/2 takes up less space on your desk. The on/off suite has on the foot, and position till and mure!

So your software runs faster, and your system is more reliable.

Extras aren't extra.
You could expand earlier IBM PCs
after you bought them, but the Personal
System/2 is expanded before you even
onen the earton. Thinss that used to

cost extra don't anymore.
Advanced graphics parallel and
serial ports, a port for pointing devices,
and diagnostics are included.
And new IBM technology—our one
million-hit memory chip, high-density
logic circuits, and integrated "planar

boards'—is sending performance up. and costs down. Paths to the future.

Models 50, 60 and 80 share a design that's new to personal computing. Technically it's described as parallel bus architecture (we call it IBM Micro Channel"), but think of it as a highway.

Our first PCs were huilt around a two-lane street. Usually that's enough, hut sometimes there are traffic jams. Your sales figures might have to stand on the corner while your mailing list goes by.

The new system is like an expressway. There are more lanes open

flow more freely.

is being introduced

in both directions. The ramps are more

smoothly payed, and signals are better synchronized. So data can

This is what the 286 and 386 chips have been waiting for A highway to

match their horsepower. The new operating systems. The Personal System/2

with a new IBM PC DOS The IBM Procesal Version 3.3 that lets you tap System/2 Model 80 trux created to into the new systems imunleash the power of the 80386 mediately, and works with

Together with the all previous IBM PCs as well. new architecture There's also an IBM 3270 Workstation and more memory. Program that, with PC DOS Version 3.3, Operating Syshelps the Personal System/2 connect with tem/2 will give

software developers new freedom IBM Mars Chan chareture is more like an expressi

Data flows more freely mainframes, supports more memory.

and lets you run multiple applications. But much more is coming. A new IBM Operating System/2*

will run on Models 50, 60 and 80. Available later on, its development is being carefully timed so that everyone involved-software makers, our dealers. you-can take full advantage of its power as easily as possible. It will do everything our existing PC DOS does (in fact, they'll get along beautifully), but it also will bring major advances. Memory: Our new systems offer up

to 16 megabytes' worth, and Operating System/2 will make these vast resources

easier to access. Multi-tasking. With IBM Operating System/2, you won't have to be a "power user" to understand how to run several programs at once. Multi-tasking

Software.

will become a routine experience.

IBM Proceed System 2 "plana to create programs features that used to be options

that are more powerful, better looking. and easier to use than ever before. A bigger idea. Operating System/2

is also part of another new idea, called IBM Systems Application Architecture. Its goal is to bring the world of IBM computing closer together; to provide a greater consistency in look, function and feel-for systems, for software and for people who use them. IBM Operating System/2 is the first step for personal computing in this promising new direction.

It's like having 256,00 in one box.

The new graphics.

Back in the dark ages of personal computing, the world was ruled by numbers and words. Graphics were a

nicety, but rarely a necessity.

Welcome to the Renaissance. The IBM

The IBM Personal System/2 has a talent for gra-

phies that's dazzling. Each new

system can paint up to 256 colors on the screen at once, drawing from an incredible palette of over 256,000. And not one of

And not one of Moscobiane Diplips 3233
those colors costs a penny extra.
Even in monochrome, things aren't monotonous. There can be up to 64

shades of gray for new dimension and contrast.

And the images themselves are greatly improved. The tiny "pixels" that create the image can now be tinier, and there can be lots more of them. Even the space between them seems to have disappeared. So pictures are





0 crayons

mountings that tilt and swivel so your neck doesn't have to.

There are four new IBM displays, and each works with every Personal

System/2 computer, all showing graphic improvements in price.

The 12" monochrome and 14" color displays are great for most generalpurpose work. The 12" color display is even sharper, ideal for detailed business graphics. And for design work, there's

coverny dis

The IBM Personal Syst Color Displays 8513. the big 16" color display with even higher resolving power.

Your favorite programs. Just about any

program you can run on the IBM Personal System/2 will look better.

will look better and will likely be more pleasant to spend time with. Many other programs are being

reworked just to take advantage of the new graphics.

But the future holds real surprises.

The screens of the Personal System/2 are like a brand new kind of canvas. How the artists will use them should be something to see.

sharp and clearly defined.

Better letters.

Equally important, letters and

numbers are clean-edged and precise,

The IBM Personal System /2 Color Daylays 8512

looking more like they're printed than projected. After a few hours with your trusty spreadsheet, you'll

appreciate that. You'll also like the nonglare viewing surface, and



The future belongs to well-connected.

The new connectivity.

The earliest computers were big and costly, so people shared them.

Then people wanted smaller computers just for themselves, Soon PCs were in offices everywhere. And how

did people want to use them?

IBM 3270 Emiliation and Professional Office System ** software (PROFS) for checking calendars and sending electronic misl

For sharing things. So the idea of PC connectivity was born.

From the start, the IBM Personal System/2 was designed to connect; with other IBM personal systems, with bigger IBM systems.

bulletin systems comes with built-in asynchronous communications (which can save you an option slot for other uses).



An executive assistant uses IBM Duplay#rise 4 to polish up memos and reports for distribution through IBM DISOSS.



The personnel director winds bulletons using the IBM 3270 Revision on Program and PROFS.



An inventory clerk uses an impairs to a data have to compair what's out in the warrhouse wash sales orders

So information has no trouble traveling back and forth. But the real news

is what happens inside. something else. Going with the flow.

4 product manager

The new architecture in Models 50. 60 and 80 will improve the flow of traffic within the system, so when an

important message comes in from corporate headquarters, it's

less likely to see stop signs. And if the sender has a properly equipped IBM PC,

data base management support

PC XT, Personal Computer AT or IBM Personal Occupator System/2 Model 30. The IBM 9370 computer

that's okay too-they work together

And as the new IBM Operating System/2 unfolds. communication will become even easier. Its multi-tasking capability will make it easier for your system to receive and store electronic mail, main-

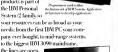
And her spendshert using the IBM Riem Roy Vencork to frame data, or whatever, while vou're busy doing

> The scope of communication has been increased, too. A wide array of local area network

and connectivity products is part of the IBM Personal System/2 family so

needs; from the first IBM PC your company ever bought, to mid-range systems. to the biggest IBM 3090 mainframe.

the lines are open. And this is



just the beginning.

4 design engineer um an IBM Prostad System/2 Model 80 to create a product accessing designs from the bost computer.



IBM just got smaller. three quarter inches.

The new media. The amazing 51/4" Floppy diskette can hold literally bundreds of pages'

worth of memos, reports and vital statistics. So why are we switching to 31/2"

diskettes?

Because they bold up to twice the information, and they don't flop. A bard plastic case protects them from misbaps that floppies are heir to.

So not only can vou slip a diskette into your shirt pocket. you'll baye fewer of

them, with more of your work all in one place. You won't have to fool around with write-protect tahs anymore, either. They're huilt right in.

Bridging the gap.

Very nice, you say, but what about all that work on 51/4" diskettes?

We thought about that from the very begin-

ning, and we're

offering a num- hades no 360kB 507 ber of low-cost solutions to make the transition as smooth as possible.

One is a simple cable adapter and software package that lets you send your data from an IBM PC, PC XT or Personal Computer XT to your IBM Personal System/2, then onto the smaller diskettes. Depending on how much data



whole job could be over in one

Also avail-

able are special IBM 31/2" and 51/1" external diskette drives, to be there

By one and

any time you need them, for conversions in either direction.

Software is here.

And what about software? Well. 3½" diskettes may be new to full-sized IBM personal computers, but they're not new to personal computing.

They're used, for example, by the IBM PC Convertible. So, many popular spread-

We're introducing a 200-millionbyte optical disk drive.

It works with all Personal System/2 computers and, with advanced laser technology, will let you build a massive library of infor-



The IBM 3503 Optical Disk Done with "x ent-one, read-mons" disks (left) and the IBM 3.5 Inch External Diskets Drue (right)



The IBM 5.25 Inch External Diskette Desce.
mation for business, science and educa-

tion on removable disks you can hold in your hand.

sheet, word processing, data base and other programs (from IBM and other companies) are already available on 3½" diskettes. And software makers are working to get new releases out quickly.

Optical allusion.

If a 3½" diskette can store large amounts of information, here's a way to store gargantuan amounts.

The solution is part o system.

The new solutions.

We sell computer systems, but that's not what you're really after.

You want the things a system can

So while we were busy developing new machinery, we were also active on the software front.

One of the first things we looked at was how you choose software. Over the last five years, thousands of programs have been written—by us and by others—for IBM PCs. That's a

independent software companies.

Setting with the program.
We're telling them about our move to 3½" diskerts so they can convert popular programs to that size. We're showing them our new graphies so they can revise software to take advantage of them. And we're keeping them up-to-date to the state of the state





IBM C4Dscraw Design and Drafting System SolutionFlor for designers and engineers.

good thing, and we want to keep it going, so we've continued to work with



So, popular programs like Lotus 1-2-3," WordPerfect" and dBase III PLUS "will be available for the Personal System/2.

Needless to say, we've also updated our popular IBM software, IBM

matched to it, and DisplayWrite 4, the IBM tested. Plus a program Assistant Series," IBM Business Adviser* and IBM educational programs are ready to go for the Personal System/2.

The IBM Solution Pac Then we looked at software from

another point of view With so many decisions to make, so many combinations of hardware and



software, choosing the right one can be confusing. Maybe you'd prefer "onestop shopping. So we created an idea called IBM

Solution Pacs You'll be able to buy them from selected IBM Authorized Advanced Products Dealers.

designed for your kind of business, with a hardware ensemble that's been

of service, training and support. A wide range of IBM SolutionPacs is in the works.

Among the first ones available are the Business Adviser

Financial Accounting Papalar programs will be available SolutionPac, a for the IBM Proonal System /2 CADwrite Design and Drafting System

for designers and engineers, a desktop publishing SolutionPac and a Doctor's Office Management package, as well as

SolutionPacs for contractors and lawyers.

They will make buying easier, and should shorten the time between "I've got my computer system" and "I've

mastered my computer system." Of course, a big role is played by the new Advanced Products Dealers. Their new "whole-solution" training

will make it easier for the two of you to What you'll get is a software package assemble the best system for you.

New power to the prin

The new printers.

Most of what shows up on your computer screen is seen by just one person. You.







so popular was speed, versatility and convenience. So what

The IBM Processer II do you get more of in the Proprinter II? Speed, versatility and convenience.

new members to the existing family.

The IBM Proprinter II.

What made the original Proprinter

2 There's now Fastfont," an extra-fast draft mode. Switching to "near letter quality" is faster too, because now

there's a button for changing modes. There's also a choice of typestyles, and of course you can still load envelopes from the front and put in single sheets any time you want.

The IBM Proprinter II is for anyone who wants to print text and graphics, with a printer that's fast and economical.

The IBM Proprinter X24 and Proprinter XL24.

The IBM Proprinter X24 and Proprinter XL24 are new. The "24"



But what comes out of your printer

The IBM Proprinter and the IBM

goes out to the world. So it has to look

professional, and getting it done has to

Quietwriter' Printer have earned high

marks from both customers and critics.

be easy; virtues that have made IBM

personal printers best-sellers.

Nos our

printers are even

The IBM Proprinter XL24 has a wide carriage, ideal for

ted page.

stands for 24-wire technology. What that stands for is new levels of Proprinter quality for everything you put on paper.

Both models print letter quality text with greater detail and graphics with better density and definition. The improvement is easy to see.

So is the performance. When compared to current, best-selling, comparably priced 24-wire printers, the Proprinter X24 and Proprinter X24 print 1½ to 2 times the draft output in the same amount of time.

The Proprinter XL24 has a wide carriage for spreadsheet printing, and both have an optional sheet feed for added paper-handling convenience, plus FontSet." an option that lets you choose from 11 other typestyles.

The IBM Quietwriter III Printer. Earlier IBM

Quietwriter printers have always been The IBM Quaeturner III Printer with single-

easy on the ears, but the new IBM Quietwriter III Printer is even quieter and goes nearly twice as fast, printing executive letter quality text and graphics in an executive hurry.

There's new flexibility in style, as well. The Quietwriter III Printer comes with four different type fonts built in and you can combine typestyles within the same document.

If that's not enough, there are optional font cartridges that give you the freedom to use up to eight typestyles on

one page.

There's also a new dual-drawer sheet feed (with optional envelope feed) that lets you use letter head stationery for the first page of a letter then plain paper for the rest.

No matter what level of price or performance you need, there's an IBM personal printer to fit the bill. And they lit very nicely with the IBM Personal System/2.



There's also an innovative

It's not just what you b but where you buy it.

The new support.

As we designed the IBM Personal System/2, we weren't just thinking about products. We also paid serious attention to how, and where, you buy them.

The IBM Personal System/2 offers so many possibilities, so many new ways to do things better, astute guidance must be there if you need it.

So we're raising the har for customer support. Naturally, our IBM Marketing Representatives are fully knowledgeable about the Personal System/2. But also, we're bringing even greater levels of support from our dealers to you.

IBM Authorized Advanced Products Dealers.

Announcing the new IBM Authorized Advanced Products Dealers. Selected from our already out-

standing dealers, they're being specially trained and qualified. They will have the IBM Personal System'2 computers. IBM network and connectivity products, peripherals, new IBM Operating System'2 when it swailable, and all the support you should need.

Perhaps even more important, they'll have a new focus; on systems instead of single pieces of hardware, on solutions instead of circuitry. They'll be thinking not only about the system you buy, but also about how you'll be using it.

They'll offer help with learning about systems and software, connectivity, and Operating System/2. And they're committed to new

standards of training for their sales, technical support, and service people. No matter how big your business, whether you need one computer or a whole network's worth, the Advanced Products Dealer has what you need.

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dentist, a librarian, a shipbuilder-you need help
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The Advanced Products Dealer is a procede new levels of training It's all part of the IBM Personal System/2

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Value Added Dealers. They're specialists, too. They build enhanced systems for specific industries and now, with the entire Personal System/2 family, their building blocks are better than ever. There's an Advanced Value Added Dealer who understands BM directly.

vour business almost as well as you do. IBM Authorized Dealers and Value Added Dealers.

Our IBM Authorized Dealers and Value Added Dealers will have the IBM Personal System/2 Model 30 and peripherals to go with it, plus special know-how for helping people get started in computing.

IBM Marketing Representatives. These people have special skills for

helping large companies and educational institutions make the most of their investment in the IBM Personal System/2.

And now, through the IBM

Customer Fulfillment Option, our customers may also work with our dealers and value added dealers to

get the best of both worlds; additional support for the Personal System/2 plus the benefits of dealing with

Congratulations are in order.

It's not easy to qualify (and stay qualified) as an Advanced Products

Dealer Our expectations are high. as high as yours are. So when you visit one of our Advanced Products Dealers, give them a nice pat on the back. They've



A system that's bigger sum of its parts.

A new direction.

The IBM Personal System/2 arrives in the wake of some fairly eager public speculation. So we expect there'll be a focus on "the new IBM PCs."

But our focus is different.



While the machines are certainly key to the system, they are not The System. It's bigger.

And it hegins, not with chips or circuit boards, but with you. After all, if our products don't answer your needs, you don't need them.

So everything about the Personal System/2-how we build it, how you learn and use it, where you go to buy it, and how well it works with your other systems-is balanced to give you the highest overall performance.

A new quality.

We're making the Personal System/2 even more reliable than our earlier PCs.

With new Very Large Scale Integration technology, many pieces in a system are now replaced by one piece. Our one-million-bit memory chip reduces complexity, too, So costs go down, dependability goes up, and you get more

work done in less time. We're also using more IBM-

made components, and we're subjecting our systems to more rigorous testing.

We even operate each one for several hours before it goes out the door. Yet in creating all this new technology, we didn't forget that three million earlier IBM PCs are out in the world. So

our two generations are close relatives, and your investment in equipment and training is protected. Nor did we forget that many of

you have larger IBM systems. The Personal System/2 will help you build better connections with IBM mid-range and mainframe computers.

New help.

We've also made the Personal System/2 easier to learn. New IBM manuals, tutorial



So will the people

you bought it from.

Our new Advanced

Products Dealers

and IBM Market-

ing Representatives won't just sell you the

right system, they'll be

diskettes, and start-up procedures will

help you get your system going quickly.

A continuing tradition.

It's said in the world of computing that the only constant is change, but that's not entirely true. In IBM's world of computing one

In IBM's world of computing one thing holds firm, and it's the notion of partnership between our people and our customers. The Personal System/2

is a product of that partnership. IBM people

are some of the best listeners in the basiness. Father IBM Rs and the over IBM Present Section 2 tract. and when they

want, they do something about it.

We're very proud of them all, and

We're very proud of them all, and the more you know about the IBM Personal System/2, the more you'll undorstand u by







And now for the fine print.

All models include integrated display support, 256-color graphies capability, clock/valendar, and ports for serial, parallel and pointing desires. All systems use a common BPM enhanced key board and accept party BPM Personal System/2 monorhornes or color display, All models accept the 200MB BPM 303G Optical Disk Drive optical System/2 and a serial parallel para

	Model 30	Model 50	Model 60	Model 80
Microprocessor	8066	81/286	89286	80386
Potential system throughput ¹	Lp to 29/2 times PCXT	Up to 2 times Personal Computer AT	Up to 2 times Personal Computer AT	Up to 3½ times Personal Computer X
Standard Memory	640KB	IMB	IMB	Up to 2MB
Expandable to		7MB	ISMB	16MB
Diskette size and capacity	35 mch 720KB	3.5 mch 1.44MB	3.5 mch 1.44MB	3.5 inch 1.44MB
Fixed disk ³	эмв	эмв	44,70MB	44.70.115MB
Additional Options			44, 70, H5MB	44, 70, 115MB
Maximum configuration ³	2)MB	ээмв	BSMB	23/MB
Expansion slots	3	3	7	7
Operating system(s)	PCD083.3	PCDOS 3.3 and Operating System/2	PCD053.3 and Opening System/2	PCDOS 3.3 and Operating System/2

Now that you've read all about the new IBM Personal System/2 and examined its specifications, what should you do? 7 Go to your telephon [Gall 1-800-447-4700]

Go to your telephone. Call I-800-447-4700 (ext. 9) and you'll learn who's the IBM

dealer nearest you. (In Alaska call 1-800-447-0890, in Canada 1-800-465-6600.)

ada 1-800-465-6600.) And here are two things to ask when you finally get face to face.
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authorized dealer or IBM Marketing

Representative about the IBM leasing programs.

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The IBM Personal System/2. IBM

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#* 160 PMC 101 3 000 2 000 3

Make these "people" laugh, and you could win \$100 worth of software.



Announcing the 1987 Computerworld button contest!

Every year, as all you button freaks know, Computerworld distributes tens of thousands of buttons at trade shows around the country. For several years now, against our better judgment, we have been letting you. our readers, write these buttons. To our surprise, you have written some good ones (like those shown here). So, we're doing it again

We're looking for a few good slogans --witty, relevant, SHORT (these are small buttons), and at least moderately clean. You may send in your entries on the form below or a copy

But you may NOT send us everything that comes into your head. Our offices aren't big enough to handle all that paper! Please take the time to narrow your ideas down to the two best you can come up with (test them on your friends).

All entries will be shown to our panel ol judges, who will be tied to their chairs until selections are complete. Six winning slogans will be picked, and everyone who sent in one of those slogans will be eligibile for a prize. Il you are the only one to send in a winning slogan, you win the prize. Il more than one person had the same intelligent

idea, we'll pick the prize winner out of a hat. Prize winners will receive a \$100 certificate good towards the purchase of software from a friendly neighborhood computer store

All decisions of the judges will be final. and no representations as to their competence, skill, or sense of humor are being made. All entries will become the property of CW Communications/Inc. Deadline for entries is May 1, 1987 at our ollices in Framingham, MA.

> frontier COMPUTERNO



YES, I'd like to enter Computerworld's ridiculous button contest. My two slogans are written below. I understand the rules above, and realize that these entries will become the property of CW Communications/Inc. I hope your



Framingham, MA 01701-9171.





Address State: ____ Phone (in case I win): . SEND TO: Mary Doyle, Computerworld, Box 9171,



N E W P 0 DUCT

Processors

Unbound, Inc. has introduced the QV series of its Qube desktop computer sys-

The QV series is said to support the Digital Equipment Corp. Microvax II pro-cessor and large capacity Winchester disk drives using the enhanced small device in-

A typical entry-level configuration includes a Microvax II CPU, 5M bytes of main memory. RX-50 dual floppy disks or an RX-33 single floppy drive and an 85Mbyte half-height Winchester disk drive. It

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onstration Package

an support nine users. Main memory can

be expanded up to 16M bytes and disk storage capacity can be expanded up to 760M bytes. Prices for the QV series start a

Unbound, 15239 Springdale St., Huntimeton Reach, Calif. 92649.

Graphics systems

Template Graphics Software, a dryof Megatek Corp., and Tech-Source, Inc. m Minneapolis have an-

3B00 VME bus graphics controller. Figaro is said to be a conformant implementation of the Programmer's Hierarchical Interactive Graphics Standard. It operates in Digital Equipment Corp.

VAX/VMS, IBM CMS and MVS and The GDS-3800 graphics controller generates a 1,280- by 1,024-pixel dis-

play, the vendor said. The combination utilizes the Motorola Inc. VME Delta series supermicro commiterasa workstation The Motorola VME Delta series is

ced from \$20,000. The Tech-Source GDS-3800 costs \$4,995. The single hcense fee for Figure is \$5,000. Template Graphics Software Scranton Road, San Diego, Cald. 92121.

Megatek Corp. has announced the 9100 three-dimen sional graphics display system and the 9300 advanced surface rendering graphics display system

Both systems are said to offer Tek-tronix, Inc. 4600 and 41000 and VT 100 emulation as well as compatibility with perinherals such as journels, valuators tablets, printers and large screen projectors. They work with host processors via direct memory addressing, Ethernet or

RS-232 interfaces. The 9100 offers 256 colors from a palette of 16.7 million. Features include polygon fill, depth cueing and X, Y and Z axis clipping. The 9300 offers 4,096 colors from a palette of 16.7 million. Features include dual buffering of graphics and overlay planes and true hidden sur-

The 9100 costs from \$24,500 and the 9300 from \$35,000 Megatek, 9645 Scranton Road, San

Deego, Calif. 92121.

Logic Sciences, Inc. has introduced the Turbograph 300 Series III. a stand-alone vector-to-raster processor.

The processor was designed to con vert data supplied by host IBM 3274 clusthat can be printed on various ink jet, thermal, laser or electrostatic numbers and plotters. Features include IBM 3287 emulation in Systems Network Architecture Control String and 3270 Data Stream Characters modes. Support is provided for the Computer Graphics Metafile standard.

Features include extended 8-bit ASCII character sets, hex transparent transmis sion mode and the ability to establish a introve translation from IBM code to AS

CII for up to 32 char The Turbograph 300 Senes III costs \$3,995.

Logic Sciences, 108808 Fallstone Road, Houston, Texas, 77099 Chromatics, Inc. has unveiled the CX-

II color graphics system in both two-dimensional and three-dimensional configu-Both models offer 1.536- by 1.152pixel display resolution on a 60 Hz nonin-

teriaced monitor, driven by a 13-board graphics engine. The 2-D configuration includes 4M bytes of display-list memory. eight planes of double-buffered memory and text overlay and a Sun Microsystems Inc. and Unix-based Graphics Kernal System software library. The 3-D configuration provides a shad-

ing processor and CX3D microcode as well as the same firmware with a 2M-byte display-list memory. It runs Digital Equip ment Corp. VAX/VMS-based CX3D, C and Fortran Both configurations cost \$39.995

Chromatics, 2558 Mountain Industrial Blvd., Tucker, Ga. 30084

Data storage

National Memory Systems Corp. has announced the B301, an enhanced smalldevice interface (ESDI) disk controller for IBM's RT Personal Computer.

The disk controller is said to provide support for up to four ESDI dick down with disk data transfer rates to 1.85M ber sec. It features a direct-memory addressing state machine on-board, said to allow for maximum data transfer, and interfaces to IBM's AIX operating system

System/38 Introduction to S/3B Workstation Operator Training Application Development VAX/VMS for Programmers

DC Prime

Lotus 1-2-3 Symphony

dBase III Plus

dBase III

Fundamentals Query for Users Text Management for Users

Multiplan

Displaywrite

NONES in a registered trademark of ATET TREMIX is a trademark of Microsoft

nounced support of Megatek's Figure software with the Tech-Source GDS-

VIDEO-BASED TRAINING



(INIX*/XFNIX"& 'C'

UNIX Executive Perspective (INIX Ownsiew UNIX Fundamentals for

Programmers UNIX Shell C Language Programming vi Editor

Using Multiplan DEC

VAX/VMS for Users

Ada

COMPUTERWORLD

Continued on page 71 APRIL 20 1097

What can you expect from the new LaserJet Series II Printer?

Everything.

Because the LaserJet Series II Printer from Hewlett-Packard is the



of laser printers.

Whatever your company's needs, the
LaserJet Series II will deliver the performance you expect, at up to 8 pages/

minute.

Take a simple memo like the Soup letter we created with Microsoft Word. As you can see, you can print in a variety of formats and type styles with our wide

selection of LaserJet fonts.

Or you can create a sophisticated combination of text and graphics. With additional plug-in memory, you can also produce full-page 300 dpi graphics, like

our Nuts form shown below. To do this, we used HP's new ScanJet desktop scanner, Microsoft Windows and Pagemaker⁸ from Aldus.

With support by more than 500 of the most popular software packages, the LaserLet Senses II Printer can produce whatever type of business document you need And LaserLet Senses II works with all popular PCs so it can easily be integrated into your existing system

In fact, only the price is unexpected —starting as low as \$2495*

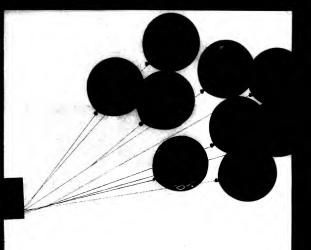
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NETWORKING

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Here on this page we offer you a graphic display of the latest developments in PC to IBM System 3X connectivity.

Each advancement is a direct result of a simple vet definitive belief. A belief that proposes if you listen to what people want, then you have a better chance of giving people what they need.

This is precisely the spirit that has made us the leader in PC to 3X communications. A position earned through progressive thinking and

supported by progressive products.

With 5292 Model 2 emulation you can create and print graphs right on the PC using 3X applications such as IBM's Business Graphics Utility. This eliminates the purchase of a \$7,000 graphics terminal.

You can revel in 3180 terminal emulation that transforms your PC into a full 132column display terminal. Use it to view expansive 3X financial or data processing reports in their entirety on the PC.





Windows with multiple host sessions





Our windows feature multiple host sessions. You see the real time status of up to four sessions on one PC screen.

If you need to connect additional users. but communications ports or station addresses are limited, consider IDEAcomm 5251/Share. Up to three user PCs, each emulating two sessions (terminal and printer), can access the System 3X through software.

We also have IDEAcomm 5250 products for remote synchronous communications. Call us at 800-257-5027. Because when it comes to 3X communications, only one company displays this much power.





SYSTEMS & PERIPHERALS

Continued from page 66 The 8301 is priced from \$695 in quan-

National Memory Systems, 355 Earhart Way, Livermore, Calif. 94550.

Tolerant Systems, Inc. has announced the Model D510 516M-byte Winchester drive and the Model T310 and T320 nme-track magnetic tape drives. According to the vendor, two Model

nme-track magnetic tape drives.
According to the vendor, two Model
DS10 drives can be mounted side by side
in the standard 194m. racks of the vendor's Eternity series system cabinet. The
DS10 is compatible with the Storage
Module Drive electrical interface.

Moduse Drive electrical internace. The T310 and T320 drives operate at 50 in Juez. in start/stop mode. The T310 and supports deal-data recording denanties of 6.250 and 1.600 betin. The T320 also encourts 800 bein. densities.

The D510 costs \$17,500. The T310 and the T320 cost \$16,500 and \$17,300. respectively.

Tolerant Systems, 81 E. Daggett Drive, San Jose, Calif. 95134

Terminals

ton Ohn 45479

NCR Corp. has announced the Quick Service, Bar Restaurant and Food Service point-of-sale systems. The Quick Service System for multurnit customers features stand-alone in-

telligent terminals, sales activity tracking, casher accountability and an integrated manager's workstation.

The Bar Restaurant System offers more than 800 mema items, up to five menus, more than six servers and tracking of more than 400 guest checks. The

system can be inked to up to six terminals and four multiple remote-preparation printers or CRTs.

The Food Service System can track more than 400 guest checks as well as three menu levels with more than 300

ritems.
Prices for typical configurations range from \$2,500 to \$4,500.
NCR, 1700 S. Patterson Blvd., Day-

Tektronix, Inc. has announced a keyboard and firmware said to give its 4200 Series Color Graphica Terminals both Dgital Equipment Corp. VT200 and IBM Graphical Data Display Manager (GDDM) compatibility. The compatibilities allow users to run

VT200 alphansumeric applications in addition to all existing 4100 and 4200 graphics applications. GDDM compatibility supports the graphics functionality of IBM 3179G terminals as well as IBM 3179 alphanumerics. Also, the 4200 terminals support segments and provide local disobles for memory.

The 4200 series will provide VT200 compatibility at no extra charge beginning in May, the vendor said. GDDM compatibility is included with the optimal coaxeal interface price of \$750. Praces for the 4200 series range from \$2.495 to see one.

Tektronix, P.O Box 15273, Portland, Ore. 97215.

General Business Technology, Inc. has introduced the GBT Laserstation for the IBM Systems(34, 36 and 38. The Laserstation is said to be compatible with Displaywriter/36 software. It includes the 6636FM, an 8 page/mm. desktop laser printer, and the 7710DS, a fullfeature display with a 3180-style.

keyboard, the vendor said.

User program access provides zoom control, alternate character sets, keyboard buffer and cursor location. The user can store up to 3,947 characters in any of

board buffer and cursor location. The user can store up to 3,947 characters in any of 24 memory locations and play them back on demand. The Laserstation is praced at \$4,495. Optional font carringes for the 6636PM

cost from \$150 to \$330. An optional programmable mouse costs \$100
General Business Technology, 1891
McGraw Ave., Irvine, Calif 92714

Lexi Computer Systems Corp. has announced the Lexi 1019 compact laser printer.

The 1019 is said to offer 10 page/mm.

bilities. It provides 39 bar-code types. Including EAN-8, MSI, UPS A and Code 39. It emulates the IBM 5219 and features a switchable RS-232 interface, 36 resident feets, customized fonts and 300 dot/in.

Pent resolution.

Vector graphics capabilities include line, box, circle, pie, arc and fill patterns. The Lexi 1019 is priced at \$5.690.

Lexi Computer Systems, Suite 1D.

231 Sutton St., North Andover, Mass 01845.

Input devices

NBI, Inc. has introduced the Pro-Scan image scanner. The Pro-Scan is a flatbed scanner and to allow users to scan line art, schematics. computer-aided design drawings, forms, paper stocks, books and other formats up to 8% by 11 in. It can also be used to obtain halftone renderings of original art.

Pro-Scanis priced at \$9,995 NBI, P.O. Box 9001, 3450 Mitchell Laws Boulder, Colo 80301

Aedex Corp. has announced the Aedex MBL-300 moving-beam laser scanner. The scanner is said to attach to a highspeed decoder such as the Aedex BCD 200. It was desurmed to operate in applica-

tions where noncontact scanning or no hand movement is desirable. The MBL-300 scanner with heavyday cord is priced at \$795.

duty cord is priced at \$795. Aedex, 1070 Ortega Way, Placentia Cust 92670.

Goodyear makes tracks with its National Advanced Systems mainframe

The National Advanced Systems maintrame provides the flexibility for undo not computationally intrinses scientific work and the MVS systems that lose pour shop going, it is very powerful processor for the oblier, and its more flexible than spooral-purpose mechanises. We're very happy with National Advanced Systems* Kan Diezide, Manager of the Technical Computing Facility, The Goodynar Tie & Rubber Company.



National

Advanced

THE REPORT OF THE STATE OF THE

Rubber Company puts a new tire on the road, the reputation of the world's largest tire producer notes with it. And noise. And noises And noises Goodyear's tires are famous for peak road performance that sorts the world's largest tire producer apart from the competition.

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CASE Technology brings the same benefits to software development as CAD/CAM has brought to manufacturing. Both CAD/CAM and CAD/CMM has brought to manufacturing. Both CAD/CAM and CASE enforce a disciplined, engineering approach to the develop-ment of systems. Both use interactive graphical design techniques, design checking rules, encyclopedias of design elements, and simulation. These techniques are applied and enforced throughout all phases of the design, development, manufacturing, testing, devicement, and manufactures or acress. epicyment, and maintenance process. CASE provides process and tools for every part of the software

lifecycle and for every type of software system. Large and small commercial and scientific, online and real time system development can all be improved with the use of CASE technology. Difficult tools have been created to focus on particular aspects. tools have been created to locus on particular aspects of systems development and project management and different types of software systems including COBOL, PLI, C.Ada, and embedded applications. Figure 1 shows some key functions provided by CASE products Products which implement all of these functions for the development of all types of systems and standards (eg. D.O.D. 2167) will be discussed and analyzed at CASES

Front-end CAD/CAP diagramming techniques: Most CASE tools utilite computer-aided design and programming techniques to create diagrams of the system design. Analysts are able to create, verify, and revise drawings on an interactive screen. Specifications for the system are stored in graphical form in a central dictionary

Or encyclopedia Design analyzers: The function of the design analyzer is to dete internal inconsistencies, ambiguities, and omissions in the design specifications. Design analyzers in current CASE tools are being

tants and expert systems Code generators: Marry CASE tools are moving toward the incor poration of a code generation module which generates application code automatically from consistent design specifications

SPECIFICATIONS

Encyclopedia or repository: A number of CASE tools incorporate an automated encyclopedia which is used as a central reposi knowledge about the enterprise and its structure, functions, prores, data models, data enubes, entity relationships, process models, etc. Sufficient detail is maint. cedure so that program code for that procedure can be gene

Expert Systems: A few CASE tools are beginning to incorporate caper: systems: a few CASE tools are beginning to incorporate expert systems that apply inference processing to a knowledge base which contains data and rules: finitially, expert systems are being used to detect inconsistent or incorrect data base actions. However, they are likely to be extended to support the front-end graphical.

they are likely to be extended to support the front-end graphical design process, and to generate efficient code.

Methodologifes: CASE tools are moving toward the incorporation of a disciplined methodology that guides the making step-by-step in the application of the tool. The application of a comprehensive methodology brings a morre standardized approach to systems development, and enables management to gain better control over

The functions of CASE tools are described in Figure 1 below. All of these concepts and the tools which implement them will be dis-cussed and analyzed in CASES.

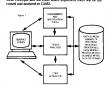


Figure 1

Day One of the CASE Symposium pross the CASE technology, the characteristics of CASE systems, and was CASE development environment. The presentation will show you how these major components are integrated in specific products.

MAJOR TRENDS IN CASE TECHNOLOGY

The design of CASE products is being driven by important technology trends in the following areas

Human factoring: Major unprovements have been made in human interfaces, including simplified, intuitive command interfaces, elimnation of alien syntax, use of graphics, etc.

workstations within the PC environment. The PC environment pr vides dedicated processing capability, decisecond response time, superior graphic cs, and access to thousands of PC software

Dealgn automation: Front-end graphical design techniques are being improved rapidly. These support the specification of systems in graphical form using consistent diagrams that are sufficiently complete to be converted automatically into code.

Artificial intelligence: CASE tools are making increasing use of Al techniques, including the incorporation of expert system shells and a knowledge base of rules of interface.

These technology trends are converging to produce a new genera-tion of tools that are fundamentally different from previous technol-ogy. Digital Consulting's featurers and consultants will alert you to the significance of these new trends in technology, and will also how individual CASE products in acceptance these new ideas.

0 N

Davi Over

The first day of CASE Symposium provides a complete review of the technology, the major trends, characteristics, components, environment changes to the software life cycle, productivity benefits, and future issues

Days Two and Three

Days two and three of CASES consist of one-hour technical product presentations from all of the leading developers of CASE products. Consultants tron DCI will be available to deet you to the rail presentations and asswer your questions on CAS technology. Distriptived guest speakers including Dr. Peter Chen, Albert Case, Ken Orr. and Edward Yourdon, will appear during the function and afternoon to share their insights into where this technology is heading. Evening hospitalities will allow you to actually see and test the leading CASE products hands on

DAY ONE SEMINAR



Dr. Carma McChuv

Guest Speaker

Dr. Carma McClure: internationally known author and fecturer will lead the CASE Symposium oversess: Dr. McClure specializes in software methodologies, software law and project managem ent. Since 1974, she has served as a software of suitant to the industry and has worked with major corporations including Time. Inc. Blue Cross. Blue Sheld Western Elec-tric. GTF, Bell Labs, Bellione: Debold, Nedorf, Texas Instruments, Digital Equipment Corp., and Dupont.

Dr. McClure is a software engageer and has taught software engageering courses at Elmois Institute of Technology (IIT) and Dr. McCaire is a some are engineer and has taught somewire engineering courses at union assume or rectaining to rectain the Morthwestern University. She has co-developed several video-based training courses on structured techniques, structured design methodologies, and software maintenance. She has also served as a National ACM Lecturer and has conducted numerous processional seminars on software maintenance. Her midshaling credits include numerous articles on software and six books, including four on-authored with Ivenue Morter

CASE SEMINAR OUTLINE

Overview of Computer-Aided Software

- Engineering (CASE)

 2. CASE Technology
 a. What is CASE
 - Technology
 - b. Automation of Antomabori
 - c. Automation of Software Lafe Cycle
 - d Linking Design Automation and Program Automation e Total Solution to
 - 1 Evolution of CASE Technology
- g. Current CASE Issues 3. Characteristics of
- CASE Systems
 a. New Software
- Development
- b Graphic Design Canabūties c Central Information
- Repository d. Tightly Integrated
- e Full Lafe Cycle

- 5. CASE Environment
- b PC Tool Sets c Mainframe Tool Sets d PC-Mainframe Link 6. Changes to th

Tiered Architectures

Software Life Cycle a. Front End Loading

Increased Emphasis

dation Tasks

on Analysis Phase

b Object-Oriented

d Rapid Berative

Prototyping

for Testing

e. Manming the Need

f Merging Development and Maintenance

Program Design c Maximizing Manual

- Correctness and e. One, Two, and Three onsistency Checking 1. Key CASE System
- 1 CASE System

f Prototyping Support

g Automatic Code

h Automatic

- Companson Coterna 4. Review of Vendor
- Products A discussion of how to categorize CASE a. CASE Toolkits
- Programmer Tooliats h CASE Workbenches
 - Software Engineering Workbenches Information
- Worldbenches 7. CASE Productivity c CASE Methodology
 - Companions - Documentation - Gudance Systems
- Strateges Benefits a. Increasing Productivity by a factor of 20 b Getting More from Each Developer

- and Maintenance Ell
- c. Reducing the Change d CASE Studies on CASE e Short and Long Term
- 8. Related Technologies a. CASE's Domanant Role
- h Software Republics as a Development Methodology c Role of COBOL
- d Absorption on Fourth Generation Technologies
- e Incorporation of Fifth
- 1 Emerang Issues
- 9. Future Trends a. Habitable Errorcoment - Beyond Liser Friendly b Intelligent Training
 - Intelligent Methodology Drivers d Software Reusability -

Days 2, 3: Product Presentations CAP GEMINI SOFTWARE PRODUCTS, INC.

AMERICAN MANAGEMENT SYNTEMS ing in applications development. AMS v. Life-cycle. Productions: System. (LPS). integrales

roductivity tools from AMS and other vendors for strategic system planning design development maintenance and project management LPS produces all deliverable work products required by most methodologies. Major pornone of LPS operate on PC v. Implementation. configuration control and fourfidation: modules operate on IBM manifolities APPROPRIATEDERS gen & Collis a worldwide pro-

lessional services organization organic in ac-

counting and auditing his convenies and management information consulting Ar Andersett will demonstrate a DENGN I based planning and design front end to the firm's computer-integrated software engin-eering environment. DESIGN 1 supports indesign and prototyping using IRM PC compatibles and various LANs ARTHUR D. LITTLE, INC.

The PC-Raged tool RMA: information Researce

Management Aid: supports Arthur D. Little v methodologies for strategic seytems planning

and data modeling as well as structured analyse and prototyping The planning methodology relates business objectives to sys-IDMS and Datacom ARTHUR YOUNG & COMPANY and management consulting firm and is we rise it with Knowledge-Ware to develop the Interna-tion Engageeing Workbench (IDV). In addition to using the EW for systems building and

and management underpartings for informa-

ASYST TECHNOLOGIES, INC The DEVELOPER workbench software provide DEVELOPER allows the use of any methodolo at all dewred levels of compliance and more its Customer module coupled with its Import Export functions allows an new link in other

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ADWARE is an OEM supplier of TOX ILS for the Engineering Information Systems: All TOXILS country on IBM XT AT AT 4 T-6300 Wang PC and other BM compatibles using a properties rain-based technology. With RULE TOOL experts create rain-based modeling methodologes and use the Design Graphic System environment for Bule checking Complete Model Data may be transferred to COMPANION APPLICATIONS, e.g. Data Diction es and Code Ge

issaely to market its CAP Genini exists excusively to marker or MultiPro System. MultiPro is an application development entrumnent integrating PC bases product stone into the EM mandrage empro-

any development life cycle and it uniquely addresses the business aspects of system development MultiPro automates aspects of ext discurrentation within its manifeative resfest Project Library System CGJ SYSTEMS, INC.
PACHASE is a full life-cycle CASE product. It

miegrates. Moniframe and PC based analysis and design workstations for the development santerance of application specification and mantestance of application specifications introduced through active prototypes, a centralized enlergine-wide dictionary that controls and minages all tusiness specifications and generators which transform the detonary-based specifications threthy min complete OFEU, applications including all code and

CHEN & ASSOCIATES, INC et & Associates Baton Rouge Louisiana is a

ment. Products (Pt.-based) to be presented are ER-Designer which defines your informa-tion requirements in Entiry-Relationship dia grams. Schematien which generates schemas for your database systems (from my re-based to musticame based). Normakger, which nor-

CORTEX CORP

CorVision's au application development system that automates the entire software develop-ment life cycle for the DEC VAX VMs on coupment using a technique called Pictur Programming Picture Programming allows DP professionals to visualize an application by plication generator technology for the DEC

CULLINET SOFTWARE, INC. Coupling based PC dough tool which aids in the logical design and physical implementation of

databases and applications. Product supports Entry modeling. DESs. Normalization up to SNE conversion of Normalized relations into Logical Data Structures, and the automatic Logical Data Structures and the automatic acceptation of DDDL syntax Communications link allows definitions of softerms maps dailing, and applications defined on the PC to be uploaded to HOSE computer.

D. APPLETON COMPANY, INC.

(DACOM) solves bus D. Appleton Company (DACOM) solves bus-ness respuesarness problems by applying asset-management principles practices and tools to information DACOMmethodologies for information instern planning RAF and develic and reuse data assets for

PRODUCT E many products available in this new and gre products while each is still fresh in your mi classification system for the various product

We are fortunate to have the leading vendors companies soll make detailed, functional one pendacts with you. Each company appearing description of the product(s) they plan to p
pages of this brochure. To get the most out o minutes reviewing the participating compar

The Computer-Aided Software Engineering S

Attences Magazoment Sesteme

Arthur Anderson & Co Arthur D. Little Inc Arthur Young & Co ASYST Technologies. In CADWARE Group Ltd AP Germini Software Products. Its.

among the presentation

hm & Associates Curtex Curp Cultinet Software

Data Architects Inc Digital Equipment Corp. Index Technology Corp James Martin Associates Ken Oer & Associates Inc

armonth & Burchett M Manager Software Products McDornell Douglas IST Meta Systems Ltd Nastec Corp

Netron Inc. Pensyotic Systems, Inc. happy Software, Jos

rology later Texas Instruments Transform Logic Corp. Visual Nettware

DATA ARCHITECTS, INC. (DAI) is a system.

Data Architects Jos (DAI) is a system consulting firm that offers both customated and packaged solutions to its informational chem have DAI and EXSS life will demonstrate EXSYS—the Expert System for business soft-ware development EXSYS makes possible the development of systems directly from state ments of lacts in English EXSYS-eleminates prostrenment and comfanes analysis, design, and

integrate a comprehensive one-step develop-ment approach EXSYs is the one product which supports the entire life cycle DIGITAL EQUIPMENT CORPORATION

As a leading computer manufacturer Digital provides a range of integrated Application ere took for solutions to business

Days 2, 3: Product Presentations

INDEX TECHNOLOGY CORPORATION

RESENTATIONS

emposium (CASES) is a unique way to anlayze the wing lechnology. You can compare and contrast. d. On Day One the seminar leader will present a which will help you effectively allocate your time

n this technology presenting their products. These event. These descriptions appear on the next few the product presentations you should spend a few es and the product(s) they will discuss

PRODUCTS
LIFE-CYCLE PRODUCTIVITY SYSTEM

INFORMATION ENGINEERING WORKSENCH

MULTERO

DEDESIGNER SCHEMAGEN NORMALIZER

CASE PROOF OT

DATA RESOURCE LEVERAGE RAP POM INTEGRATED APPLICATION DEVELOPMENT TOOLS

EXCELERATOR EXCELERATOR RTS CUSTOMIZER

ASSET PRODUCTS
OF THE PROPERTY DESIGNMACHINE INFORMATION ENGINEERING WORKBENCH LTO-MATE PLUS

MANAGER MANAGERVIEW PROKET WORKSENCH PSL PSA, STRUCTURE URED ARCHITECT STRUCTURED ANCHITECT - INTEGRATOR

NETTON CAP PRECE PROMPLES, PROBLE PLINESPLES

DOLYMANT DAY AT BEAUTAN RAND DEVELOPMENT CENTR US DEVELOPMENT CENTRAL

THE CREATE THE DEFINE THE PLAN THE RELATE.
INTO CREATE CASE SYSTEMS SOLUTIONS
INFORMATION ENGINEERING PACILITY

ILIK DESIGNER TEXOLIKE COMPUSE BULL TOKIL

and engineering problems. The unique offerings are workstation based and address all aspects of the Applications Development Life Cycle They are interested into the VAX highware

4.5s Delt is a suite of Computer Associed Solfware Engineering (CASE) tools, widely used for 899 fetts analysis design in North America and Europe Delt supports datallow programstructure and entry-relationship diagrams if deta dectorary and forms design. Development projects using Delt have reported significant projects using their nave reported signal and productivity gams in all phases of system build-ing analysis, design, development, documenta-

HIGHER ORDER SOFTWARE, INC.

Engineering product for specification, design, analysis and automated code construction it is table' graphics USE IT performs logical analysis and produces source code (COBOL C. Pascal and ERETRAN) and documentation. Available nex (VAX and IBM) and the IBM

Index Technology Corporation the leading developer of CASE tools that automate the suffware development life cycle as the creator of the software development life cycle to pro-duce analyze modify and generate specifi-canous documents. Customarer Indon canons documents. Customprer 1: Excelerator and Excelerator Real Time

pury that has developed a comprehensive methodology for information resource management, systems development, and information IntoModel BMTC software has been developed IntoModel will persent an overnew of its methodology and the capabilities of its

HARTS MARTIN ASSOCIATES

culturing in improving productivity and quality in sistem development. CASE tools can be applied su cestally only within a deciplized consutent and complete development approach. JMV will present the techniques and tasks of the Information Engineering Methodology

KEN ORR & ASSOCIATES, INC. Ken On & Associates Inc. six

NORR & ASSOCIATES IT:
Ken On & Associates loc specializes in building integrated software engineering enterinments that incorporate technology tools and
accordingly The Designtraining for maximum productivity. The Desig Machine is an BM PC-based CASE find the esternates the regarrements and analysis phase of systems development it automatically generates design deliverables from system database II has embedded software engineer up roles and built-in quality control

and distributes expert-system knowledge based software tools for information engineer my. The Information Engineering Workbench Workstation uses advanced CAD CAP techni-cues that are integrated through the Encyclo peda (a knowledge-base) and an expert asstern module to create verify and revise dia every on the computer screen making a trub

LEARMONTH BURCHETT MANAGEMENT SISTEM (LBMS), INC to m intromatica

development will demonstrate AUTO MATE. PLUS, a PC based tool which provides hall support for developing systems using graphs port an oriverpaig resorms using graphics form documentation reports an integrated design database and ex-line data translation tion in addition AUTO-MATE PLUS automatically transforms logical data models into physical designs for IDMS ADABAS or

MANAGER SOFTWARE PRODUCTS (MSP)

The MANAGER Family of Products in dedicated to supporting all phases of the 5x5-tems LifeCycle from Strategic Inkartiata in Planmine to the generation of enabled code. Along with the MANAGER Family MSP will be present-ing measured With the Intelligent Workslotten based Graphical Information Engineering two the marriage product Corporate

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Profit WORKBENCH is a new IEM Pt -based information system that automaticthe application of proven structured techniques to the strategy, systems planning solidyse. And

META SYSTEMS, LTD manirant-based production (CAN-1 soil are which completely automates the colorprocessed developing information v customers arelade withe of the world's most

customers unuser with of the Assau-prentigious companies and government militar-organizations. They use PSL PSA (host based Structured Architect (PC graphassionis.) Strutured Architect - integrative (on the host) and other Meta tools to develop large and complio.

NASTEC CORPORATION Vaster Corporation organitors of the UNI

tools concept develop tools for both construct cul and acrospace delense engineering will ware developers. The DesignAid analysis reconverses as without the a multi-user develops peoplaramer whenever is a made down access ment system operating in the IBMPC and DES VAX environments. DesignAd automates set wate development from resumments defin-

THE NETRON CAP Development Center is a

CASE withern for building custom: portable COBOR software using a frame based withware engineering process called Bassett Frat Technology NETROW CAP unites the post called Bassett Francis bong development manifesance life code into an automated specification procedure. The open design architecture allows unimated autonative of additional apply atom (up, tression ames and PL's VAX systems and

Days 2, 3: Product Presentations

PANSOPHIC SYSTEMS, INC.

software products to improve application pro-ductionly and control will present TELON. The TELON application development system captures design specifications to generate COBAL or PL Lapplications. TELON assess the transton from analysis to design by providing inter-faces to leading from end analysis tools. TELON components include Directory Dat Administration Screen Report Painters Pro

and PlorCe offers a bill line of both performance easy-to-use more developme tools that help programmers more efficient applications possible Plink@lipkis the only linkage editor with advancapabilities is considered the industry star dard Payerry Phoenics recently appointed un vades a cotto Land reporting canabilities per mush available only on maintraine and

POLYTRON CORP POLYTRON CORP POLYTRON offers the leader

for MS_DOSPC and VAX VMS subvice development. PVLS montains services and revisions of suffware systems. PubMake automatically reliable any desired sable object modules. The ti wirk together or indepe sty with AN

RAND INFORMATION SYSTEMS, INC. Rand Internation Systems Inc. a company

software and services company speculates in productions software and watern development The Rand Development Centers RDC) no programmer workbench and tool managers framework which supports application develop-

SAGE SOFTWARE, INC

ports the APS Development Center (APS) APS trockacts comprise an integrated latesty of computer userd software-engineering (CASE) tools for RM Development Centers. AFS products encompass the software development bicycle and support drawing prototyping syntrating testing and cantenance of COBO

SOUTH ARE INC

Inc. wil present MAESTR() the inte-Soloware. Engineering. Environment MMOTRO creanges and manages the software through real-time project manageme MAESTRO integrates customastile tools for design coding testing documentation and maintenance is language independent and fits in numerous hardware and

TECHNOLOGY INFORMATION PRODUCTS TIP provides completely integrated method ologies and software for system planning

analysis design implementation and man tenance TP PLAN helps alentily define and DEFINE structurally describes a postern vi-DEFE graphically describes a system class: total and information requirements. TIP BELATE automates building the normalized relatestal data model. TIP OREATE then generates (1980), PHI programs.

TEXTRONX, DX
Teltrinis, list has participated in the evolufrom all the computer-aided software industry for over a decade. Text already has an established UAN: base in the engineering and scientific market sectors, and is currently inpluring other opportunities and applications. Tek's family of suffsure development tools as

TEXAS INSTRUMENTS The Information Engineering Facility is de-

signed to automate the complete systems development life-cycle. It consists of a powerful mariframe encyclopeda and PL-based, graphs cal toolsets to support analysis and design an demonstrate today the major component-4 the product excluding strategy planning anabose design (TROE code pre TRANSFORM LOGIC CORPORATION

software design development and man tenance in IBM mainleave environments. Transform Logs, will present the convece tion have management using TRANSFORM Data drawn design architecture environment independence and design prohibiping are

VISLAL SOFTWARE, INC. Visual Sufficient Inc. develops and markets as monated lumity of personal LASE track for the multi-user IRM BC enterpersent. The VS an information repository. Visual's unique an information repository. Visual's unique articligent architecture for presonal adapts bility enables the product to adopt to standard

ation currently offers three BM PC-based LASE tools for developing commercial and real time systems. The Yourdon Analyst Designs income offers cost effective automation of Four-tion Structured Analysis and Design Methods COMPOSE is an case-to-use test formatter for of war deliverable documents and Descripe Tooliet to upour vour organization s

lace to operate like well known word

By attending CASE you will Learn How:

- · CASE technology applies to software development the same igneering procedures that have been successfully used in CAD CAM technology · CASE technology is fundamentally different from third- or fourth-generation technology
 The components of CASE technology make it superior to engling
- technology

- To evaluate and compare CASE products To incorporate CASE technology within your current development
 - methodology

 AND WHO THE KEY PLAYERS ARE IN COMPUTER-ADED SOFT-WARE ENGINEERING

CASE Technology Revolutionizes and Improves Software Development By:

- 1. Counce MIS management more control over projects Providing an environment that supports the entire development life
- process

 I Present the systems analysi by providing automated tools to support the creation of design diagrams data models and system
 - 1. Dougrafing removeful graphs at design aids to deline and document saltware syste 5. Unliving interactive prototyping techniques to clarify user requirements and to ensure that developed systems meet user needs
- 6 Capturing designinformation in sufficient detail required for automatic 7. Venlying and validating functional specifications to detect errors and 8 Promoting reuseablity of software components and other soft-
- 9 Providing automatic documentation lacinities that are continually up-to-date and that are guaranteed to be consistent with systems

SPECIAL FEATURES

GUEST SPEAKERS



ALBERT F. CASE, JR. Guest Speaker
Albert F Case, Jr., a nationally known

lecturer and author, is Director of Technology Transfer for Nastec Corporation, a emputer-Aided Software Engineering firm Mr Case has spoken at many nation spore on enthuses development in 1986

Case was elected to the ACM National Lectureship Program. His articles have appeared in numerous publications including Computervorld, System Development, and ato Monogement (the DPMA journal). His most recent book. Information Systems Development: Principles of Computer Aided Software Environment was sublished by Prentice-Hall in 1986. His Team Systems Analysis, will be published by Prentice-Hall in 1987



DR. PETER CHEN

Professor, L.S.U. and M.I.T. inder, Chen & Associates, Inc

Dr Peter Chen is internationally known for his original work on Entity-Relationship (ER) approach to systems analysis and database design, which has been used widely all over the world. He is Foster Distinguished Chair Professor of Comput Science, Louisiana State University, Baton Rouge and is, currently Visiting Professor at Department of Electrical Engineering and Computer Science, M.J.T., Cambridge, Mass. He is also the founder of Chen & Associates (Baton Rouge, Louisiana), a firm providing

track, consulting and training in species analysis and the Dr. Chen received his Ph.D. from Hurvard University in I rocat, received and straining in repleme analysis and design. by Chen received has Ph.D. from Harvard University in 1973. He served on the management school faculties of MIT and UCLA before moving to LSU in 1983. He spent one year at Honeywell and one summer each at IBM and DEC in the early seventies working on advanced computer system projects. He has edited four books and published many articles. He is the Editor-in-Chief of Dana & Knowledge Engineering, published by North-Holland. He has also served as consultant to many comporations and lectured

WHO SHOULD ATTEND

- · MIS Develops & DP Managers
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inc., which specializes in software engineering environments that integrate technology. tools, and training for maximum productivity. As one of the principal developers of the Data Structured Systems Development

(DSSD) methodology, he directs all research and develop activities for advanced DSSD technology and computer-aided software engineering (CASE) tools Orr is a leader in the systems technology "structured revolution", the foreign of the information spaces field. With a mathematics background, he's held key positions in management consulting.

state government, and software development He currently con-sults with major clients - including Piscfic Telesis Group, Bell Communications Research, and Santa Fe Railway - on strategic systems planning data architecture, and CASE. A frequent speaker at international conferences and se A mequant special at international contentions and seminars specializing in systems planning and development. Sen is the author of Structured Systems Development, Structured Require-ment Definition, and The One Minute Methodology. He has also been a contributing editor to PMCS/STEDS managine and has sentten for COMPUTERWORLD. SOFTWARE NEWS, and other industry



trade publicatio

EDWARD YOURDON

Vice-President of Planning

DeVry, Inc. Edward Yourdon is Vice-President of Planning for DeVry, Inc., the educational sub-sidiary of Bell & Howell Mr Yourdon has worked in the computer industry for nearly 25 years, including positions with Degtal erent maintrame computers and been

involved in a number of properting projects In 1974, Mr. Yourdon founded his consulting firm, YOURDON, Inc. to provide a forum for educational, publishing and consulting state-of-the-art technology in the computer field. As chairman of the company, he oversaw an operation that trained over 100,000 people n major companies and government agencies around the world He is the author of 14 computer textbooks. his most recent entitled Nations at Risk. The Impact of the Computer Revolution, which has been excerpted in computer journals in the United States and throughout Europe Several of his books have been translated into Russian, Japanese and a number of other languages. His articles have appeared in virtually all of the major computer journals, and he is a regular speaker at major computer conferences

PROCEEDINGS

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This beautful hotel features a sx-story afrium and a number of fine restaurants, including. Veronique's elegant dating at its best-complete with a harpsit to entertain and relax you during dinner. The Terrace, a more casual atmosphere featuring lighter fare, and the African Cafe which features only light entrees, as well more castal consequence enough gights one, assume owners and well-in dancing areas. The hotel as Crystals, an elegant bur which features an array of gleaming brass and well-in dancing areas. The hotel itself is for ated only menutes from Washington National Auport, and a short Metro ride from Capital Hill, the need in the discussion minings or on a secondary of the Anadod Federal and a short need from caption risk, me State Department, and the National Gallery of Art. An added Fedure of this elegant hotel is The Underground at Crystal Urty, a turn-of-the-century shopping willage located only a less steps away undermeath the hotel The Marrnott Crystal Gateway is located at 1700 Jefferson Davis Highway Arlington, VA 22202 PHONE (703) 920-3230

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EXECUTIVE REPORT

CASE

Tools of the trade: Is CASE really a cure-all?

BY HM HULING

CASE revolution proclaimed the chilbert keynote speaker at a recent symposium covering commuter-aided soft (CASE) While well

se words may not have been well chosen for a technical and ence ever watchful of marketing hype and still reeling from the 'revolutions' of fourthgeneration languages, relational data bases, structured program ming and real-time syster

Let's face it: The idea of going through yet another revolution, real or fabricated, is somewhat less than appealing to most MIS managers. What MIS should find appealing about CASE, then, is that its tools, which were created to ease and integrate the design, generation and mainte nance of systems, do not really represent a revolution but rath er an evolution of tools and concepts that MIS has already embracod in the systems-

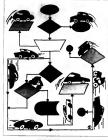
development life cycle The methods CASE tools support are those of structured analvsis, design and development techniques whose benefits have long been recognized in the in-

With that information in mind, what MIS managers must do is decide if acquiring a CASE product should be the next step in their continuing efforts to de velop better systems. The an swer lies in understanding the products' benefits and in examming the major problems in using

The big decision Also realize that when you are considering purchasing a CASE tool, you are about to face what

may be the most difficult soft-

Bermingham, Ala. office of Ernst & Whoses an international auditine tree and consisting from



INSIDE

What's in a CASE tool kit?

Pacbase moves Allied's DP transition Arco taps Excelerator for data modeling Tips for making product choices

on you will ever ture, CASE products must supmake. These products are relaport a process that can vary dratively new and, like most prodmatically according ucts in rapidly growing markets, What also complicates the acation process is that the

CASE needs of the MIS organi-

zation may be difficult to define.

Unlike applications software,

which often supports business

functions of a more stable no.

CASE product, much more than the selection of other software, must be based largely on what its future direction and ultimate functionality will be (see story page 81)

Many components of these

to the

systems are not new to the in dustry. For example, graphics tools that support the drawing of diagrams and code generators that can produce modular units of program source code have been commercially available for

What is new is the concept of a functionally complete, fully integrated tool that would support the entire systems-develop life cycle. But while most CASE products represent a significant improvement from the older. stand-alone components are able to completely fulfill the

The principal component most CASE products offer to day, or will offer someday, can be grouped into the following categones, diagraming tools, includ ing data-flow and data-structure diagrams as well as program structure charts: syntax venfi ers, information repositories. prototyping tools, including menu, screen and report genera tors, code generators, life-cycle methodologies, and project management tools (see storn page

On the plus side

Although their functional capa bilities vary widely, some CASE products available today offer significant benefits. The follow

many of the manual tasks of satems development. By using diagraming tools that provide spe cial keys for creating each symbol and then allowing the analyst to change the size, shape and color of the symbols as well add textual descriptions CASE products can make development easier and more accu-

Also, in the past, analysis were as reluctant to change neatly drawn diagrams as they were to revise the subsequent design By automating the redrawing process, the analyst can more easily incorporate revi sions and reproduce the diagrams. He will be more willing to

CASE tools

re options and alternatives and will ultimately produce a better final product

· CASE products can generate signifi capt portions of the system's documentation automatically, using the information captured during the analysis process. Data-flow diagrams, data odels, structure charts and the data specifications contained in the information recoulory can form significant sections of the system's final documen.

CASE products can provide greater

Each analyst, while agreeing with me components of a particular methodology, will usually, in the end, adhere to his own development process. But the MIS manager wants to provide a standard methodology that possesses sufficient incentives and proper enforcement mechanisms to ensure that analysts use it. CASE products, by providing a methodology integrated with a set of automated tools, offer an alvets a means of obtaining the greatest benefit possible from the tools

Products that contain or interface with project management tools can also enforce the methodology by incorporatmg its steps into the overall project plan and follow up by tracking their

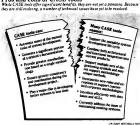
· CASE products can provide greater consistency and coordination in large scale and medium-scale development projects. Even within the steps of a single methodology, different analysts an produce their own diagrams and entation that, ultimately, are difficult to integrate into a total analy

On the other hand, the CASE tools provide a standard set of diagraming symbols, specific requirements for documenting information flows and a dition, because the CASE product rep resents a single information resource for all byproducts of the analysis and design, the coordinating MIS manager can readily access the complete specifications, even though they may have been originally created by more than one analyst

Overall, CASE products can play a

major role in developing better sys tems to less time, partly because the Continued on page 76

Pros and cons of CASE tools



Key elements of CASE kits: Prototyping, code generators

ate a functional road map of the neering (CASE) tool lot contains variety of instruments. The nem analy amount and event today, or planned for tommorrow. fall into several categories

corner

CASE products is a graphics the systems analysi uses to draw the various symbols sociated with a particular methodology and then enhance that drawing by adding size, col-

Most products support three oc types of diagrams. Data-flow diagrams provide nbols for the various proces es and flows of information that make up a function. As a result they belo the analyst describe tire organization or its smallest department Data-flow diagrams are easily decomposed in reasingly higher levels of detail while maintaining consistency Data-structure dusyrams indi cate not only individual data ele-

ments but their intricate rela-As with data-flow diagram they belo the analyst record and

refuse relationships among the dut a in increasingly lugher levels of detail and are effective for ex ploring alternative data struc-· Program-structure charts cre-

system prior to coding. At their highest level, these charts may indicate the flow of planned programs within the system's over all architecture. At the individual program level, program-struc ture charts allow the analyst to describe the functions of the oroand provide the detailed information needed to begin struc-

Syntax verifie Must

port a particular structured anal at and design methodology Whether the methodology is that of Yourdon, DeMarco, Gane and Sarson, Warmer-Orr or others it will most likely possess its own set of discraming symbols and roles governing their use. An important component of CASE products is the ability to verify the accuracy and completeness of the information that is entered into the system, according to Particularly in large projects

products

in which more than one analyst may be involved, it is essential to enforce a standard in both dia grams and data specification Some products provide syntax checking when information is entered while others perform this function as an altogether sepa rate process. In either method, syntax verification should apply to individual diagrams and the

each system Information repository tion repository, often referred to as an encyclopedia. This information resource goes beyond

ry by providing a mecha man for storing all types of sys-CASE Stan For example, screen and renort lavouts insende code, docu mentation and project schedules may be stored, in addition to diagrams and data specifications The principal benefit of this com ponent is that it coordinates, in tegrates and standardizes the different types of information

the typical functions of a data dic-

The heart

products is

CASE

and makes them easily accessi-These tools go graming

ble to the analyst.

specifications to present the analyst with a work ing model of the system. They also give the user a tangible rep resentation of the system Most CASE products provide three principal prototyping tools: · Menu generators construct a series of menus outlining the enemual components of the sestem. These menus may be linked

used for data entry or inquiry · Screen generators allow the analyst to paint the desired layout and consect of a screen with out entering complex formatting and data specifications. With the combination of diagrams and information repository data information that make up fields may be quickly indicated

edited and moved to various · Report generators, similar to screen generators, begin with a blank screen and then simply in dicate what information the re port should contain and in what format. In addition, they can in-

and sequencing in creating samples of the system's reports.

Code generators are an imnent of CASE for two reasons. First, they en-

able the analyst to generate units of source code from high-level specs. The code generators of some CASE prodacts use some to indicate various functions in the program mod ules and data-defined flows of in formation and them translate these symbols into programs Using code generators, the ana hist can specify the system, gen erate code, test the system, revise specifications and generate the code again. Although many generators cannot accommodate omplex system specs, they can provide a mechanism for crear ing prototypes that are more de

tailed and easily modified. Second, code generators provide for the creation of reusable code. Within most systems there are a number of standard modu lar functions. By retaining and

user path through the system or identifying the specifications of to actual screens that may be these modules, the analyst can often configure significant porreusing these components

Life-cycle methodology

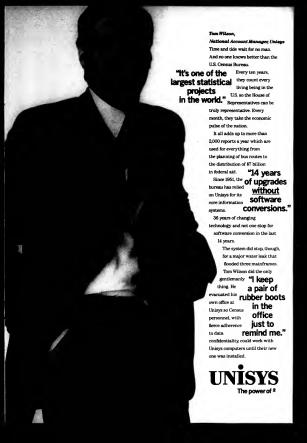
The nents discussed so far relate to stens in the sys tems-development life cycle. An equally important component is integrating these individual tools into an overall methodology. Some CASE products provide

he detailed steps of an entire life-cycle methodology through dicate totals, paging, print edits checklists or narratives. In addition to cording the analyst through the process, this provides a mechanism for monitor ing and controlling the entire project. Although this may limit the analyst to one methodology some products change or delete existing steps and add new ones as required to address the organization's own requirements.

> Controlling the development of often as challenging as the system's analysis

and design. A critical componen not wadely available in CASE products today is a set of pro management tools. Some CASE products integrate their compo nems with popular standalone project management tools, whole others will develop these caps bûties for future releases

In either case, the integration of project scheduling and reample will be entical to CASE products' supporting the sys tems-development life cycle. . DMHULING



EXECUTIVE REPORT

CASE tools

analyst can be more productive with the prototyping and code meration processes The ultimate benefit of CASE products is the potential development of systems that will more effectively meet the reguarements set forth by the orgamization. By automating signifant functions of the analysis CASE products can allow the analvot to concentrate on more accurately defining the specifications. And, by enforcing a structured systems-development process, the tools can help the analyst develop a more efficient system. Moreover, when

the system is finally delivered, a

CASE product can provide easi-

er maintenance and enhancements throughout the system's

Neat, simple and wrong According to H. L. Mencken For every problem there is one solution which is sample, neat and wrong," For the MIS manager who focuses exclusively on the benefits, CASE products may appear to provide his com-

nany with a simple and next solution to every systems-develop ment problem. It may also be the wrong solution.

ou must weigh the benefits of CASE products against their disadvantages. Unfortunately. current advertising focuses on the benefits of a single product that supposedly will support the entire life cycle. Although the nefits may appear obvious, the

extent to which current prodacts offer them varies considera-

use the evolution of the CASE products is not yet com plete, you must gain a clear un derstanding of the actual functions and capabilities currently available and consider them as a part of a vendor's long-term di rection for a product. Your pur chase should represent an in estment in the future of a product that will ultimately provide effective support for your organization's entire systems development life cycle.

The trouble with CASE In evaluating both the current functionality of the product and its future direction, you should always be aware of the following trade-offs of using CASE prod

• Incomplete functionality Many CASE products do not yet support the complete systems development life cycle. Some offer only a single component

ucts.

Y focusing exclusively on the benefits, CASE products may appear to provide a simple solution to every systemsdevelopment problem. It may also be the wrong solution.

while others combine a mature functionally significant element with other recently developed and loosely coupled components that may be less complete. You must evaluate both the exact combination available and the functional maturity of each com-

popent · Lack of integration. Two types of integration are important in a CASE product: architectural and functional. Architectural integration means that the combinain of components should appear as one product to the analyst. For example, all compo-nents should be accessed through a common entry point

such as a master menu In addition. Help and other major function keys should be the same when possible, and the analyst should have the capability of storing information in a sinale repository from any compo-

With functional integration. the analyst should only be required to enter a piece of infor mation a single time. What this means is that each tool must be able to pass information - in the correct format and with the proper meaning - to the next

The complete delivery of both types of integration has not passed from conception in Continued on page 78





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USER INTERVIEW

Pacbase pros and cons

Allied Van Lines, Inc., the Illinois-based transportation firm, completes all new development with Pachase, a CGI Systems, Inc. CASE workbench tool. Pachase helps control unstructured development work and lets Susan Bennett, data administrator for Allied, keep the data dictionary consistent.

Bennett spoke recently with Computerworld Senior Editor Innet Fiderio

Describe Pochase. It's a Cobol generator that features a series of fill-in-the-blank screens. The programmers create screen layouts or report layouts, and it generates basic skeleton programs. The next step is filling in the cryptic patterns of

the fill-in-the-blank parameters. The programmers do that in place of writing code, which develops the next step. For a last option, used if the program is too sophisticated to handle what Pachase can produce generically, procedural code is available.

This is shorthand Cobol. All those pieces are put together and run through a precompiler, and Cobol source code is produced and compiled like any other Cohol commie

So Pacbase will give you more than just Cobol skel-eton code to fallaw?

I don't think we've found anything in Cobol that Pachase can't do. But I don't think that we've stretched it to its limits. Un until December 1986, we only did one major project with it, and that voice-entry system.

w what do you use Pacbase far personally?

I manage the data, which we consider a corporate asset. We have VSAM files and the TIS data hase from Concorn Systems, Inc. and we are in the process of converting to Cincom's Supra rela-

tional data base. use the data dictionary of manly because I keep track of all the data and when new projects come in. I do the file design.

Has Pochase made your lab easier?

As far as the dictionary goes, it makes my job much easier because it's automatic. One of Pacbase's best features is maintenance, cross-referencing. For example, whenever you use an element in any kind of program, it is automatically stored as a cross-reference in the dictio nary, no matter what.

So you can always track your work? Right. There are very few ways

you can make a mistake

We are in a transition period at Albed. We were using primarily VSAM and some TIS files, and oow we are looking at using TIS and Sunra. Potentially, we also have IBM's DB2

So we need to have a marriage of these different kinds of files. Pachase makes our transition relatively data-independent. It allows us a long-term, orderly transition in which the programs will be insulated from data-struc-

What about docume Pachase automatically produces

technical documentation that is excellent Also Purhase is very ordered and structured, and it forces environmental control. There is no other way you can do your job. You have to do certain things in a certain order, [the programmers) have to come to me to get their data elements, and documentation for validation is on the data element itself it's not even in the program. So

all that gives it an option for bet-Does Pacbase have any

oblems? There are some rounts that I don't like. Most of them are due to the unplementation rather than the concept of the product Many of the features that CGI developed have strong concepts. but the implementation is often cumbersome and a lot of times

is it difficult to use?

Yes. I've seen a lot of other software packages on the IBM 3270 and a mainframe, and I really don't think [CGI] has taken advantage of that software/hardware combination. For example, when you are keying in long strings of text, there are four or five fields on the screen, and the actual line of text is the fifth field You can't touch-type. You must watch the screen and then tab yourself over

Up until this release, 7.2. transaction programs. They also



Allied's Be

there was no renumbering. So if you numbered by 10s and then decided you needed another paragraph, you had to renumber everything by hand. Also, it has a Conv statement but not a Move

Pacbase has a Capy state-ment and not a Move

Right. If you want to move something you have to copy it first and then delete it.

Another problem is that the product has only been in the U.S. for two or three years. That means that no matter how much money we are willing to pay, we cannot find anyone with more than three years' experience. Also, CGI's education is poor.

Their manuals are impossible mostly transliterations from French. It's not a straightforward

product; all the screens are full of cryptic parameters - things that aren't immediately obvious. Once the staff is trained, they're fine. But it's not a three-week process, It's maybe three to six months, depending on the cod-So those things make it hard-

er for us to use. The on-line system, however, is excellent. The programmers love it What is that like? It's like writing CICS on-line

have a comparable feature for writing batch programs. The programmers don't like that one at all

Everyone says the on-line system takes away a lot of the tedrous tasks. They really feel, after they get used to it, that writ ing in Pachase is better than writing in native CICS code.

But in the batch system. I think resistance is too strong a word. They don't really resist it. but the comments have not been complementary. But they understand that it is very necessary for Alised Van Lines to have the dictionary complete and to keep its integrity. If they write some thing in Cobol. it's not in the dictionary, and when it comes time to do maintenance, we won't know about it. That is so impor-

tan For the most part with Pacbase, we feel the whole is greater than the parts

is the key benefit of Pac-base that it keeps your ctionery consistent?

I think so, It's active, If some thing is used in a program. I don't have to track around to the programmers and ask them to give me documentation or to let me know about it. If I not validation in the dictionary, it is there immediately the next time a program is compiled So those things for the maintenance aspect are very valuable. •

APPH 20 1997

COMPUTERWORLD

CASE tools

able architectural integration, others force the analyst to enter and exit sepa-

In addition, true functional integration still exists only as an idea. The CASE products that may someday support the entire systems-development life cycle will be those whose vendors have accepted the incorporation of both architectural and functional integration into the product as a long-term direction

 The support of a single methodology. For the MIS manager whose organization translate diagrams from one methodology

employs multiple diagraming or design techniques, selecting a single CASE prodact may prove to be a difficult task. Most of the CASE products available suppor only one set of diagraming symbols and may or may not provide methodologyunique features such as enterpriser modeling or data structuring and normaliza-

Dick This problem has two solutions. One is the purchase of multiple CASE products. But while this may resolve the immediate. short-term problem of supporting multi ple methodologies, consider, too, the re-

lated problems of integration and stan-

The second alternative involves the vendor's future direction. The ability to nization and whose future includes the

The most up-to-date training in the

UNIX System, from the people who

keep the UNIX System up-to-date.

well as the expanded functiona hty that would en-

development life cycle multiple tech mques, are much discussed topics among those interested in the fa-

ture of CASE Are prototyping tools is products. A product that will offer some degree of support to the greatest part of the orga-

eventual connect of multiple methodolo-

erans and is per

sonal, thorough,

Life cycle coverage

Asking the following questions of CASE tool venders will help you determine where the available CASE products fit into the

What places of the life cycle are supp

gies may be the better choice for an MIS manager to make. · Few alternatives for co Very few products offer the MIS manager the capability of incorporating new rules and exceptions to the standard method

ologies that would satisfy the needs umque to his organization In choosing such a product, you must examine the organization's willingness to completely adapt to the methodology supported by the product

PRODUCT whose future includes the eventual support of multiple methodologies may be the best choice for an MIS manager to make.

· Lack of effective interface with data base management systems and fourthgeneration languages

Many MIS managers have recently es tablished long-term directions for their organizations by choosing a data base management system and fourth-genera tion language. A major issue encountered in selecting a CASE product is its com-

patibility with the chosen DBMS and fourth-generation language. Although few CASE products actually interface with these, consider how the product will support the process of data base design how the information will be transferred and whether the prototyping tools of the Continued on page 83





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ATEST

USER INTERVIEW

Breaking bottlenecks

A year and a half ago, Dallas-based development and data administration professionals at Arco Oil and Gas Co. tested and purchased Excelerator, a CASE tool from Index Technology Corp. Troy Worthy, supervisor of data administration, uses the product to speed data-modeling procedures.

Worthy recently spoke with Computerworld Sensor Editor lanet Fiderio.

As a data manager, how did you come to use Excelerotor?

We got involved with Excelerator when we were looking for a tool to automate our data-modeling process. Most of the mainframe tools were expensive and weren't really full-functioning Then we came across the Exce lerator product, which our development people had been looking

Did you go with Excelerotor salely because it gove you on outomated data-

Initially, yes. But shortly after we made the decision, Arco started restructuring the whole business, which meant I had to come up with ways to leverage the people I had, since our staff had shrunk considerably. We did an internal analysis of our own profits and examined how we went about the data manage ment process and found areas where we needed to make

At the same time, we realized that if the project teams were going to be working with Excelerator as a part of their methodology, then we might be able to piggyback on that use and leverage Excelerator to do some of our work for us

changes

That's when I modified a few screens from the Excelerator dictionary. Most of our internal development is done in Cobol, and Excelerator's data-capture screens don't necessarily cap ture all the information we need for our mainframe data diction nary.

Tell me obout the modificotions

I modified several screens and wrote software that takes the output from the Excelerator export function and creates trans actions that food into the IBM data dictionary. It's a two-way hridge

takes information coming from the IBM data dictionary and puts in a format that you import into Excelerator

cluded in Excelerator when you bought the product?

product? No. They give you the import export capabilities. They will export a file and then tell you what it will look like, and they'll tell you what the files are if you want to import something into Excelerator and also what it will look But the mainframe interfaces

did not, and do not, come with the product

Is that a shortcom Excelerator?

It's not much anymore; they adopted the one Larrete. It's be mg distributed by the Excelerator users group now. Independent of that effort. [Index Technology] did go in and devel on a mainframe interface for the data manager

Do you use the doto monogernow?

No we don't use the data manager. The feedback we got back from Hudex Technology) at the user conference was that they polled their user base and found that the user base had more data manager people than IBM people, so that was their first area of

Excelerator changed the way you do your work?

From the data administration perspective, it means far fewer forms that the project developers have to fill out. Our earlier efforts, to be absolutely honest, were very forms-intensive. We were pretty much viewed as be-

ing a bottleneck in the organiza-So [Excelerator] has eliminat ed the filling out of forms. Proect developers still have that opdefinitions between the mainframe and Excelerator.

usest

I also wrote software that Whot obout productivity



ncreases? Have your bot-

tlenecks dissolved? The tool has improved our productivity. I can't give you exact figures, because right after the interfaces that I mentioned early er were developed, development activity slowed because of the

We did, however, work with the developers during a major production redevelopment activity. Part of the process we go through is to develop logical views of the data.

On that specific project, when developing the logical views, the developers got almost a 10-to-1 productivity increase. That meant they developed their logcal news 10 times faster than they would have previously. The application was a big one.

and it had a lot of data stores involved with it. When we showed Ithe developers) how to do it with Excelerator, it really increased their throughout What about new releases?

We got the new release of Exce lerator - Release 1.7 - shortly after the first of the year. Since then. I've developed more software to work with it so we can transfer IMS segment

What are you running Ex-celerator an?

Here it runs on a combinate

Wyse Technology PC286s, persome IBM Personal Computer XT equipment

Was it difficult to learn to use Excelerator? No. it's not difficult from my per-

spective, but it does have its

Like what? It doesn't support Cobol to the level I would like. We still do the majority of our mainframe applications in Cobol. Particularly on the element definition side it >

What development meth-adology do you use, and does Excelerator support

The SDM structure development methodology. It's basically Yourdon data-flow diagrams and models. And no, we don't have any problems with methodology

support Are you sotisfied with the product? Yes, I'm definitely pleased We

were doing data modeling by hand After you redo models multiple times, you finally get in changing them will make you stop before you should Exceler ator eliminates a lot of that .

The TeleVideo 955. Seeing is believing.

WYSE WY-50

TELEVIDEO 955 (Unretouched photo)

Sure, most \$600 terminals can scrunch 132 columns onto a 14" screen. But you need a magnifying class to read them.

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In brief: Tool selection

Know your MIS needs, the vendors and the product market

Selecting the right co uter-aided software engineering (CASE) tool is a difficult task A crowded market products that constantly change, hard-to-define MIS needs and CASE tools that must be select ed, in large part, based on their future direction are a few of the snags you will encounter in the acquisition process. The following critical steps, however, can help e a solid product choice.

· Clarify your objectives. Whether your objectives are as simple as acquiring a tool to automate the drawing of dia-grams or as complex as establishing a tandard structured development methodology throughout the organization, to select the right product, you need clearly

+ Organize your efforts. Create a se lection team composed primarily of MIS professionals involved in the design and development of current systems. In addi tion, carefully selected user representa-tives may provide valuable insight into components of the CASE product such as documentation, prototyping tools and diagrams by evaluating their effectiveness as communications tools. One of the first datail. Your selection team should request a demonstration of each product, and it should evaluate the performance and ease-of-use of each product in a hands-on session. Contact other organizations that use each CASE product and docum their responses to a set of strategic ques-tions about the effectiveness of the product and the support of the vendor. . Evaluate the vendors. Since many of

the potential benefits of CASE products will result from a vendor's future direction, your selection team should choose a vendor as carefully as it does a product. It is important to research the market po tion of the vendor by examining how long the CASE product has been on the market and the amount of products that have

The number of individuals dedicated to supporting and enhancing the product can

also indicate the vendor's con the product's future. · Examine the costs. The selection team should also consider the total cost of

each top CASE product. This process invol than the price alone. The costs for hard

CASE product evolution
By the 1990s, reusability and intelligent methodology drivers will be key CASE

Long. Distr.	Mai	1.6	Large French
computer-sided socumentation tools	Automotic design analysis and checking	Automatic code generation from design specifications	Intelligent methodology driver
computer-aided diagramming tools	Automated system information	Linking design automation and	Habitable user interface
inalysis and design tools	repository	program automation	Reusahility development methodology

INFORMATION FROM CREATING CARRIES AND THE COMPARED PROGRAM CONSCIENCE PRO

tasks of your selection team should be to review and discuss the project objectives. . Research the products. If you and your selection team are not familiar with current tools, gather as much information from as many CASE vendors as possible and review the literature. This will give you a picture of the functions and capabili allable in CASE products today . Define your requirements. Once your team understands what is available

for a CASE product. These requirements may include the apport of a particular methodology or the ability to interface with a data base management system. The complete list of

and prioritized in a checklist. These requirements will form the basis against which candidate CASE products will be

* Evaluate the products. Next, compare each candidate CASE product with the requirements checklist. Products that fail to meet the most critical requirements should be eliminated. Of those that remain, the two or three bushest rated products should be explored in greater

ware, maintenance, training and time lost during implementation are examples of the related costs of a product that should be estimated and documented. These costs will provide information

rucial to determining which system of fers the greatest benefits at the most ef-. Consider the insues. Before pr

chase, your selection team must con implementation issues, ranging from training and installation to how the product could be integrated into the organiza tion's current systems process. By examming these implementation issues before product is purchased, the team can make a more accurate assessment of each product's impact and can incorporate this ict into the final evaluation.

 Make your selection. Your team's final selection should represent the assumi lation, review and evaluation of all the information gathered in these steps. Now you can be confident that by following a structured approach, your team has cho sen the CASE product that represents the best use of your organization's resources ..

Four in the front: The PC market leaders

he computer-aided software engineering (CASE) market is check-full of vendors offer ing everything from tool kits to consulting services. The following are the four vendors that lead the market in terms of the number of cooles of commercial personal com-

puter-based CASE products sold: · Index Technology Corp. calls sta CASE product Excelerator, which is an analyst/designer tool lot introduced in August 1984. Retailing for \$8,400. Excelerator runs on the IBM Personal Computer AT, PC XT and 3270 Per-

sonal Computer; Compaq Computer Corp.'s Compaq Plus, Deskpro 386, Deskpro 286 and Portable III; Deskpro 286 and Portable III AT&T's PC 6300; Wang Laborato ries. Inc.'s Professional Computer: and Texas Instruments, Inc.'s Professional Computer. Index Technology, based in Cambridge, Mass., has sold 5,500

copies of Excelerator. tec Corp. introduced its Case 2000 Designaid workbench for the PC in 1985. Currently priced at \$6,900, it runs on the IBM PC XT, PC AT, 3270 PC and compatibles. Nastec has sold

2.500 comes of Decompad to date. The company's headquarters is in South field, Mich

 Knowledgeware, Inc., an Atlanta based company, has sold 1,200 copies of its Information Engineering Workbench. It runs on PC ATs or 100% compatibles and retails for \$7,500. Knowledgeware introduced the information Engineering Workbench in No.

 Cadre Technologies, Inc. in Prov. idence, R. L. introduced its Teamwork analyst/designer tool kit in June 1985. The most recent information available indicates that the company has sold 200 copies of the product. Teamwork runs on workstations frum Sun Micro systems, Inc., Apolio Computer, Inc. and IBM as well as Digital Equipp Corp.'s VAX. The product retails for \$8,900 for the workstation version. In January, Cadre bought a PC-based workbench, PCSA, from Structsoft. Inc., which introduced the CASE prod uct in January 1986. There are 750 copies of PCSA installed in date. It costs \$995 and runs on IBM PCs and



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XV



Don't Be Fooled By Imitation Session Managers





CASE tools FROM PAGE 78

CASE product can be used in conjunction with a fourth-generation language.

• Applicability to existing sys

tems. If CASE products are to effectively support an organization's systems-development life cycle, they must address the significant considerations in mair taining the organization's existing systems as well as those

associated with systems devel-Much of the focus in CASE products is on systems development. However, there are significant challenges for CASE products as they apply to existing systems. One challenge is the maintenance of systems that have been developed through the CASE product. For example, consider whether you want to maintain the actual program source code generated by the CASE product or simply main-

OU must evaluate organizational considerations before making a decision on CASE. Not every company is ready yet to use a CASE product.

tain the specifications and regenerate the programs.

Another consideration in anplying CASE products to existing systems is the feasibility of maintaining older systems. Entering the specifications quired to regenerate a complete system in order to perform a modification may not be suffi event to outweigh the amount of effort involved. However, by systematically defining and generating modules of the older system through the CASE product, it may be possible to replace the system gradually while minimizing the effort for each modifica-

Making the CASE decision You must evaluate significant organizational considerations to make an effective decision on im-

plementing CASE. Not every company is ready yet to accurre and use a CASE product. Asking the following owes tions will help you evaluate your readiness to accept and benefit from a CASE product.

 Is your organization pre-pared for structured analysis, design and develop-ment? Since the introduction of evetemo-develop ment methodology in the 1970s many analysts have adopted its principles. However, an equal or possibly greater number have not. Many analysts will follow a methodology only to the point at which they can visualize the new system in terms of program code. Beyond that, they view further analysis as simply another obstacle to the coding's com-

pletion. When considering the acquisition of a CASE product, first evaluate your organization's willingness to accept the methods that the product supports.

This may involve the acceptance of a structured methodology, training in its techniques and enforcement of its use. While a CASE product may be acquired to support this process, its acquisution alone will not murantee ultima,e success. MIS must make a firm commitment to structured systems development for the

product, to succeed

· Is your organization prepared to support the specific hardware requirements of a CASE product? Many of the CASE products available today operate only in specialized hardware environments, which may not be compatible with your mainframe or minicomputer. Even those products that opermethodology, and the CASE ate on personal computers may require local-area networks to support medium- to large-scale projects. Evaluate the feasibility and appropriateness of support ing these requirements

• Is your organization pre-pared to integrate a CASE product into its entire sys tems-development life cycle? While computer-aided soft ware engineering products offer significant benefits even when Continued on page 86



What do you exp

If you think Symbolics workstations understand only one language, talk to only one kind of complete, and start at a very high price, here's food for thought: Symbolic systems start at \$36,000. And \$36,000 allows you to choose from an extensive mean and services, all designed to make our at he most easily integrated Al and advanced software development system available.

Support of standard languages/protocols symbols supports Bletner (TCPIP) BECnet; and SNA standards. One keystroke is all it takes to integrate our workstations into your current environment, be it IBM, 19EC; 10MX; or just about any other tables to the proper control of the property of

ented programming.

And Symbolics supports a range of standard languages. You'll receive the benefits of our software environment whether you program in Common Lisp, Prolog, Fortran-77, Pascal, or Ada* There's no need to learn a new programming language.

Finally, current software can be upgraded with AI functionality on a Symbolics workstation. Instead of making your previous investments obsolete, Symbolics will make them more valuable.

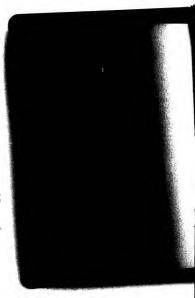
Transparent networking

Symbolics is the only workstation with a Generic Networking System. This allows you to network transpareally to UNIX, Digital, and IBM, with one simple command—the workstation initiates all necessary protocols, automatically. The Generic Networking System also allows

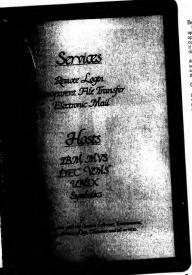
for other services that make networking easier, and programming faster. Remote Login, ill Tansparent File Tlansfer, and Blectronic Mail. Remote Login in allows users to log into any host on the network, or many hosts simultaneously, with one keystroke. Iransparent File Logic Comparent File Comparent File

It also has full editing capability.

All this is why 90% of the 3,000 Symbolics systems delivered to date are used in heterogeneous environments.



bect for \$36,000?



Best for team-oriented software development Symbolics systems allow programs or program undates to be distributed to all software developers as they're written. The work of individual contributors can be continuously integrated, even if they're working in different languages on different systems

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Add value to your current investment Adding Symbolics to your current software development network will add value to your current investment. You'll get more than ease of integration. You'll get facilities that make programming up to 50 times more efficient 40 times as many pre-coded Lisp functions

as systems that offer just a Common Lisp compiler.

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EXECUTIVE REPORT

CASE tools

they are acquired to import an individual component of the development life cycle. such as diagraming, their greatest benefits are obtained when the products are completely integrated into the organiza tion's systems-development process.

This may require substantial changes in the way in which systems are decorned. developed and implemented. For example, automating the drawing of analysis diagrams and the definition of their information in a data dictionary will certainly make this part of the process easier. How ever, if this information can be easily translated into a working prototype that

HILE a CASE product may be acquired to support a certain process, its acquisition alone will not guarantee success. MIS must make a firm commitment to structured systems development for the methodology, and the CASE product, to succeed.

users of the system can review and modu fy, then the CASE product's benefits will increase dramatically. The organization is then required, however, to dedicate time and resources for effective prototyping. If prototyping is not currently a part of your development process, you must assess the feasibility of incorporating it.

· Is your organization prepared to

implement a CASE product? The imintation issues associated with each CASE product may vary considerably from organization to organization. For example you may want to consider whether to implement the CASE product through a series of pilot projects or simultaneously throughout the organization Another implementation consider-

ation is training. The MIS manager should weigh the economies of scale and the faster transition times associated with train ing all the analysts at once against reduced distription and acclimation time the characteristics associated with a grad ual training process

Although CASE systems' potential ex ceeds the functional capabilities available today, the products can still offer significant benefits. If you combine a thorough understanding of the products with a careful examination of the technical and organizational issues involved an investment in CASE may indeed mark a first step toward a new era in software engneering.

For further CASE study

If you need more information on ster-auded software engineer ing, these books and seminars may prove helpful

BOOKS

BOOKS
The James Martin Productivity
Series on Computer-Aided
Software Engineering. Contact:
Pieter Minno, Publisher, 36 Bessom St., Marblehead, Mass. 01945.

Computer-Aided Software Engineering Symposium Proceed-ings. Contact: Digital Consulting, Inc., Six Windsor St., Andover, Mass. 01810.

SEMINARS CASE '87. May 27-29, Cam-bridge, Mass. Contact: Index Technology Corp., One Main St., Cambridge, Mass. 02142. Computer-Aided Software En-

gineering Symposia. June 22-24, Washington, D.C.; Sept. 21-23. Boston; Oct. 27-29, San Francisco. Contact: Duptal Consulting (see



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ated with the Yourdon Structured Techniques, ruses your productivity

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the easiest to use menu systems make for a professional system that offers everything you could want in a CASE system - at a remarkably low price And lest we forget, the Toolkit includes technical support from the people who know Structured Analysis and Design better than anyone And we ought to After all, we wrote the book on it Now we've written the software

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THE CASE OF THE RAGING CFO.



What were behind his impossible demands?

Tecestly, you may have cred about "The analyst who hnew too mach" and the profiless fit caused his company.
The cast all lies ded you a copy of that case story if you missed it. (Just see the coapon). But today, we'd like to share with you the story of snobler Forreast 500 company and the hendaches that the CFO there cased for MIS

this a story well worth reading. It will help you answer questions your CFO will probably sals you. It could save your company money.

And, if you are like the MRS executive in this story, you may turn out to be a here.

You will also leave about a new advanced financial software product.

You will also learn about a new advanced financial software product alled FASTAR, which was developed by Corporate Class Software, a subsidiary anaded by the \$5 billion Celanese Corporation.

The new CFO of a \$2 billion-plus consumer products company had a reputation for toughness that the MIS director soon learned was well deserved.

Within weeks after taking command, the CFO made his demands known He wanted five years of data available for each division and each product line—up from three years. He wanted faster reports and faster analysis from his staff. And he wanted MIS to arringe for all of this "as soon as possible"

There was only one problem And the MIS executive knew it. What the CFO wanted was simply impossible to do well without a fourth generation language solution. And the MIS executive had enough experience to know what a fourth generation language solution would mean.

TROUBLE, TROUBLE, TROUBLE.

There would be hours and hours of expensive programming and maniferance to support a 6th solution. And financial analysis still would not be able to work readily with their PC based spreadsheers. To complicate maners further, different parts of the existing system kept the same hinaccul data in different formats. The cost of maintaining redundant data that could not be easily shared by analysts was running higher and higher A cam of MIS executives and financial

support personnel soon came to a grim conclusion. Several months would be needed to meet the CFO's demands. And the maintenance problem would grow and grow.

What would you have done in their position? As one observer put it "They knew they had a major problem on their hands"

A DEABLATIC DISCOVERY.

The solution came from a company called Copperate Class Solware

"The executives at MIS dath 1 believe as if rist," recalls one Corporate Class executive "And 1 can't blame them. What we had produced daths seem likely."

The company had developed a product called PASTAR—Financial Application Solution to Analysis and Reporting—that was the first packaged solution to advanced.

No fourth generation languages were needed to perform financial applications No macros were necessary And all data could be loaded onto Lotas 1-2-5 spreadsheets for work there. (Yes. we'd be skeptical too You'll find our how all this was done in a minute.)

When the decision was made to test FASTAR, the entire system was set up within a week and loaded with a division: worth of data. Now, when an analyst compared the cost of a product over fine years, it took only minutes, instead of an another dw.

What's more, the CRO now had the Bezibility to assign new divisions and product lines to his analysts without the time to reprograms the system FASTAR was built to expand horizontally (for com passes) and vertically (for products). How could all this be done?

THE PRODUCT THAT ALXOUST DEFIES DESCRIPTION.

HASTA aces as a bridge between PS and mainfame financial production systems, such as the general ledger. But is no nor than a bridge It is a ready-made colution for advanced financial applications that organizes that contains were than analysis are used to working with it-by financial schedule (incompationess), etc.), by organization critical (directions, etc.) is period (day to put for four by the price (day for data) one data you choose such as retail, budge of data you choose such as retail, budge of data you choose such as retail, budge

or forecast)
With the proper clearances, analysis
can access financial information from any
financial schedule for any company in the
corporate structure. And they can consolidate and analyze that information without
ad box programming. (Our powerful analpaits package is built in, so there's no

ad boc programming. (Our powerful analysts package is built in, so there's no fourth generation language or macros programming needed. Even analysts who are composer dillecture can derive the same benefits from FASTAR as anyone else.)



constitution and management reporting

As a result, analysis report more quicks, considered more accurately, and analyse more frequently fore company found, for example, that year-end reports that used to be available more accurate or the control of the c

LINE THE REMINERS MACK WHERE

FASTAR also addresses the critical issue of data integrin, and control Because FASTAR takes all programming off the spreadshee: there are no undocumented programs to cause costh mistakes. (One analyst in arother corepain had written a 1 000 line macros pro-



RGTAR is the packaged solution to advanced francial applications that can provide quantitative and quartitive improvements to your company s financial.

gram before management pulled the plag He was the analyst who kees too much 1 FASTAR also eliminates the need for passing data back and forth on pieces of paper and having socretaines or analysts type them into spreadsheets. This reduces the number of potentially dangerous

errors that can occur.

And, perhaps most importantly, because all financial information is stored in FASTAR's data base. MIS executives regain control of critical data.

regain control of critical data. You also protect work company s irrestment. FASTAR accepts data from fourth generation language products and database: management systems: as well as microcomputer applications. (None of the companies using FASTAR needed more

than three days to adapt the program to their corporate needs.) In the final analysis, MIS executives show themselves to be strategy, thinkers by gring analysis a tool to be more productive. (Did was know that one companifound 85 secrects of an analysis time is

spent just looking for data?)
You can see why financial professionals are interested in FASTAR. And why the chief financial officer of a \$3 billion company would put his reputation on the line to become chairman of our board of

directors
But we think you have a lot of questions about FASTAR, too
We d like to answer them for you just call 212-719-8209 and ask for our free

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To Mr Richard J Lvets,
President and Chief Executive Officer
CORPORATE CLASS SOFTWARE INC
1211 America of the Americas.
23rd floor New York, NY 100-50
Please send me your FASTAR brocknam
Please oil me for a demonstration

Mease send me N. World's review of EASTAR
Please send me a copy of "The Analysi Why
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IN DEPTH

MIS gets behind the wheel

Tired of others having all the fun? Take your new development tool through its paces and show you still know how to use a keyboard

BY DANIEL NOLAN

wery DP manager faces the diferents of wasting to manutam technical solids and still meet the demands of the postion that those skills earned. As their older skills are made obsolete by avances in computer science, managers will meet the skills are the skills are as the control of the skills are the skills are as the creaming feel they are at the creaming feel they are at the

mercy of other, newer skills.

Most DP managers earned their positions through hard work and technical prowess. Each promotion leaves them inundated with more administrative details and marketing activities; before long, they begin to feel technically out of data.

When mid-management crisis sets in, managers are tempted either to snap up every nev product that comes along and promises to make their system state of the art or maintain its status quo. The former behavior will soon label them as gadget freaks, fair game for every buck ster in the business. The latter wil earn them lifetime membership in the Anti-Destination League, right along with those self-righteous drivers who lead corades down the left lanes of turnpikes at 55 mph.

Fortunately, if you are a manager, the jurceased emphasis on user fire-ndliness can be turned to your advantage if you can get some time for a businian's holiday. Buying a new development tool presents you with a perfect opportunity to build up your confidence and see if you still have what it takes technically — or to learn more about your limita-

As a manager, you can dele-

Notan is an Annandale, Val based computer scientist specializing in DBMS and fourth generation languages



gate more responsibility to members of your staff. If you do, nothing can stop you from clearing off your desk, rolling up your shirt sleeves and digging into a tightly focused, well-defined project like you did in the days before you were promoted to an oak desk and an overflowing "in" basket.

A job you could love if you decide to jump into this project, be forewarned that you may benefit from it more than you expected. You will better apneciate the work your staff is

you expected. You will better appreciate the work your staff is doing. You will gain confidence in the tools on which you rely. Just remember that in a week or two, you have to get back behind your manager's desk. So don't have too good a time.

Be prepared to demonstrate that the real benefit of gaining first-hand experience with a

product that will affect your organization will be to reduce the risk of relying on outside reports. Furthermore, reviewing ports. Furthermore, reviewing require less effort than you would spend supervising and reviewing the work done by your

in-house staff.

Be prepared, too, for the vendor's reaction. When you take
the salexmen up on their assurances that their products allow
the most junior person to become productive immediately
lack confidence in all computers
and may become amoust at the
suggestion that the person making the decision has set aside

some time for first-hand experience.

Although the overall objective is to select the best package for your firm, you must set a realistic goal. The goal is to accomplish as much as possible in whatever amount of time you can manage to be away from your daily duties.

Suited to the purpose

You will find that a decision to do the evaluation yourself is sleadly suited to the purpose at hand. You will be inclined to see flaws in the language as obstacles and shortcomings rather than as opportunities to increase revenue.

or job security.

In other words, don't feel guilty if you find yourself having fun. Recognize at the outset of the project that this approach has merrit in its own right, even though it may not produce a completed system.

In fact, most of the tasks you begin will necessarily be left undone, and the brief time limit that you impose on yourself may result in an incomplete picture of

Avoid mid-management crisis

· A schema is a table is a file

· Some old tricks work with the new language



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susiness Computing systems

the problem. This is not a concern.
As soon as you get back behind your desk, you can full in the gaps and direct others in completing the picture. At iminimit, you want to be able to determine what land of adjustments your organization will need and the ways a new fourth-generation language will affect your staffs work look.

One final pount that you should bour in much This entire cererose, including any preliminary work and final reports that need to be done, should be finalsed within two weeks. You, the person conducting the exercise, are not on a sabbastical from your other responsibilities, and taking a my our other responsibilities, and taking a my our other responsibilities, and taking a my our gray a walken some primal urges and find yourseld, unwithingly or by urges and find yourseld, unwithingly or by

VEN THOUGH you have told everyone this is just an exercise, don't forget for a minute that employees at your firm will be watching you with great interest. Be professional. Take time to chart a course.

choice, programming for a living.

Assuming, for example, that the product you decide to take on as new data base management system bagsage, your grams in this language, will will be a support of the product of the p

Whatever they are called, these linguages all posses one common element: Because they are relatively new, few guidelines exist for using the languages effectively to create application programs. While some instruction is available, it is universally conducted by professionals whose morp strength in the field is training or systems software and who consequently lack experience in applica-

tion development.

Those in charge of data processing are thus placed in the uncomfortable posturon of following recommendations that do not guarantee success or first-hand experience in a short time. Assuming you believe the sales Interature that extrolls the virtues of this modern technology, you could do one of the following.

Install the package and want for the ris-

ing stars in your organization to stop Coboing and start 4GLing.

Bring in a professional trainer, with the proviso that payment depends on your

proviso that payment depends on your staff's being properly instructed. • Lead by phowing the first row before turning the reins never to your staff.

This last strategy particularly appeals to those managers fortunate enough to be able to out themselves some slack time and who remember enough programming to do a credible job. Taking the time to build a complete DBMS application using the older versions of Cobol or assembler and CICS would be impractical.

However, the hype for fourth-genera-

tion languages maintains that the bare maintain of time and skills is required, making the experiment practical. You may risk taking a pratfall, but good leaders need to be able to laugh at themselves at best once in their careers. Step 1: Do not start programming

Step 1: Do not start programming immediately. Even though you have told everyone this project is just an exercise, don't forget for a must be that employees at your firm will be watching you with great interest. Be professional. Take the time to chart a course, and, if working on a mainfraise, make sure the owners of your computer do not object to your churning through their data.

The best application to start with is one that exaggerates any concerns you may have had about the product before smen assured you there would be no problem. For example, if your staff en counters problems in getting screens generated, you will want to try your hand at building a system that will locate files through a maze of screens that will make a video game appear dall by companson, Are you worried that an intensely interactive system will bring the computer to its knees, but you have trouble telling at just what point this slowdown will occur? Bell the cat by building an interactive system and loading down the computer.
Afterward, you will be able to recognize performance problems thundering at you om a great distance.

If your company is bogged down with batch processing, a good objective may be to compare the results of a new system that replaces those old batch suspense files with on-line undates.

One of the advantages of recent maketing is that the vendors, in usuang to the issue of rapid prototyping, have pained themselves into a corner with claims of productivity. After years of listening to assessmen suggest that the problems a with your staff, you can now ask them to hand over the keys and stand out of the way while you drive their product around the block.

Step 2: Document yourself. As a manager, you have no doubt been frustrated by your staff's inability to document its work. Here's your chance to lead by example. Begin a log and add to it at the beginning and end of each day. Since you will be programming for effect and moving very rapidly, this log will be invaluable in reporting what was done, particularly once others recalled that there was value in

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...ABOUT ANALYZING
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maybe you're starting from scratch but if you're senous about data analysis, you're ready for SPSSPC+"—a full schware family that brings you six high-powered ways to complete any data analyse task. Enter if SPSSPC+ Data Entry" takes the effort out

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92

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ur exercise and ask you to cap

staluze on it Do not let this documentation exercise become a witch bunt Guard see observations careful. ly and be constantly aware that any confrontation will be hazard-Vendors have 30 years of experience in such conflicts. Users who slap together a system, test it out and document a few damning flaws can expect the vendor to bring in a ringer who will make the computer do backflips. It then becomes an elemen tary marketing exercise to discredit the whole evaluation. Do everything by the vendor's book and give the yendor every oppor-

ON'T be put off if you don't recognize references to the "elements in a subschema." The price tag is so high that salesmen want you to think you're getting more than simple fields in a file.

tunity to correct the situation Step 3: Define the data Data is data, just as it always has been and will be until the day computers no longer need it. Don't be put off if you use ognize references to the "eleprice tag of today's technology is so high that salesmen want you to think you're getting more than simple fields in a file. Tanks

a steering wheel Although some terms may appear unfamiliar at first, you will soon find that the principal change is in the vocabulary Whether a file is called a table. container, schema or whatever, no product is good enough to ead minds. Each field has to be defined as to format (alpha or numeric), length and whether it is

worth \$80 million have "circular guidance modules:" your car has

As you need them, other options, such as phonetic searches and the ability to construct keys from partial or many fields, will emerge. You will not need to be come an expert on the DBMS for this exercise You should need to define

fields only this one time, so do it with some consideration. The power of a fourth-generation age hes in the use of a and active data dictio nary. A field should never have to be redefined once the file has been laid out. If you need to desenbe fields anywhere else, even for screens or reports, what you are working with is not a finished fourth-generation language Give the vendor one dement for premature marketing and expect some delays as you proceed Step 4: Lay out the protop when you're done.

The best method of lay ing out a program is to envision the system as if it were a compony and sketch out an organizational chart. At the top, where the president would be, is probably the main menu. Selections from the menu will send you down to the different "offices. possibly to "offices under of fices" and then back up to the

Laying out the program first and making the procedures follow a symple chain of command

a short test drive, and detours will not be productive. Never begin actual programming before the files are laid out.

will provide a concise modular development and prevent you from tripping on needless com plexities. Remember, this is just

Since fourth-generation languages use an active data dictionary, without a defined file you access about 60% of a language. The processing procedures will ome automatically from the DBMS, and the field descriptions

should come from the dictionary Step 5: You are now ready to start programming. Unless you have discovered some new principles of logic, your pro-

grams should always follow the same basic pattern: · Describe the records to process. There will be a clause equivalent to the READ and SE LECTION procedures. program should never actually deal with a record unless the rec-

ord is to be processed. Instruct the programs to do their processing. Details will vary according to which

ITS TIME YO

by IBM and DEC typically have been found in the MIS and engineering departments of large

In other words, to each their But for businesses today, it's

time to connect.

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This connection allows DEC users to access IBM mainframe power to run complex CAD proprogram on the chart you are working on. If the program is intended to load data, its instructions will store records. If it is to maintain data, the instructions will be to select and update. If reporting is the goal, the program should be printing.

Here, you will have to overcome your previous experience. You must tell the program only the minimum amount of informa-

tion to get the job done. If the job is to store a record, you will need instructions that indicate which fields contain what data. If the program is to display, you need to lay out the screen of page. In doing this, you should nev-

er repeat information. The fourth-generation language should know a Social Security number has nine digits; all you should have to tell it is where to put the digits. If you need to supply more information for something as simple as a screen, chastise the vendor for giving your

programmers headaches.

The risk of trying to be too fancy in your programming is that all languages allow the defaults to be overridden, and the override code makes the program look just like ones you write 20 years ago. You will

need to remember that field definations belong in the data dictionary and should be kept out of the program.

the program.

The the modules together with the menu. Each operation should deal only with what must be done on the chart, which records to do it on and when. Set up the selection screens so that criteria is given in ranges.

In this way, the same pro-

gram that processes the month of October by going after records dated from 861001 through 861031 can process an entire year when 860101 through 861231 is requested. Congratulations — you have efficiently reduced the number of programs

and eliminated redundant processing. Since you were working from a VTOC/HIPO sketch, expect the unexpected and be prepared to add a few overlooked opera-

tions during the course of programming.

When filling in, be careful not to overextend a module so that it is doing the work of another

OMPUTERS do not make good explorers. Each program should return through the same path it traveled, even if it touches each program for only a moment.

module. At the same time, avoid creating another module when one will do the pix. Also, take care not one will do the pix. Also, take care not of the pix. Also, take care not of the pix. Also, take and the different programs. Add and Change functions, for instance, should share a single screen and validation module. This consolidation can be accomplished on almost pix storing a base record and sending it through the update module for complete the update module for complete and the pix. Also should be consolidated in the pix. Also should be consolidated and the pix

• Set the protocol. Computers do not make good explorers Each program should return through the same nath it travelect even if it touches each program for only a moment. Most languages fourth-generation maintain some method of storing instructions to take over when a program ends that lets it leave a otprint before sending the log ic to the next module. When the last nengram ends - way down at the bottom of the chart - the logic has only to follow the bread crumbs out of the forest

If this "fetchback" ability is not as simple as described— and you should check carefully, as vendors are inclined to complicate issues they do not understand—you will have to provide a separate control module, standards and possibly a support file before you continue.

You could try to build your first system without fetchback, but the risk of getting lost in it is too high. You deserve a break by now, anyway, so take the time to do in right and give the vendor another dement.

Step 6: Check things out with a real live user. Assuming that you followed the advast about letting people know what you were doing others in the

TWO GOT ALONG

grams, manufacturing applications and other CPU-intensive operations when necessary. So programs that once took hours to run can now be run in minutes.

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company could be most interested in seeing your results.

Instead, take out your log Remember, your objective is ook and difigently write down not to build a system but to build the request. Even though you a first system. Users always know by this time that you can know what they want and will make the change in two minutes tell you as soon as they see it. Ev. resist the urge to show off and pect a deluge of change requests. concentrate instead on docu-But don't make the changes menting how close you came and

surself. Like Uncle Remus's the time it took to get to that B'rer Rabbit and Tar Baby, once you've not a hold of it, you'll nev-

Step 7: Overload the sys-

er be able to let the program go

tem. At this time, you want to see what happens when the baby kicks the slats out of its cradle This is a fourth-generation lan-guage, so you should be able to replicate the entire file with a

simple program such as: REPEAT 1000 TIMES GET EVERY RECORD STORE WITH SAME INFORMATION

Agam, expect some trouble

The file may need to be adjusted for volume, but this adjustment period is a good time to find out what is required. No dements to the vendor unless you find the

system needs adjusting more than twice At this time, you should check carefully for effects on overall machine performance. Include the operation of other sobs in your examination to make sure

your programs haven't gummed If everything has been set up

right, you should experience about the same amount of slow down as when your overweight Uncle Nelson settled into the backseat of your car - the system should continue to operate even though it may protest

shightly on an uphill grade Step 8: Review your find ings. At this point, you will want to give the vendor a call to fix any problems. Give the ven dor every benefit of the doubt

N ADDITION to gaining an appreciation of the fourthgeneration language. you will find less resistance to your leadership from the Young Turks on your staff.

and offer to turn the system over to his staff for a few days. Now that you have ventured into programming and successful ly returned, you can assess the yields of your investment. For one thing, you may be able to use this exercise to support your recommendation to bring in a fourth-generation language, or

you may decide to wait In addition to gaining an approciation of the fourth-generation language, you will find less resistance to your leadership from the Young Turks on your staff, and you will be able to prepare realistic schedules and plans of which you are confident.

Also, you can specify stan dards that will appear sympo thetic, and your staff will see you as supportive rather than restrictive. Your staff will benefit because it is following an actual pace rather than trying to live up to a salesman's promise. And if you were fortunate enough to choose an application that offers some utility, your firm will be able to enjoy the same early ad vantage of the new technology.

There is one other advantage you may have overlooked. Since you could not help but bring your old skills into this new environ ment, there is a high probability that some of those old tricks work well with the new language. Chances are your project will also be the first time answer has seen programming done that way. If this happens, try to act modest, not surprised, when you are complimented for your innoativeness and prowess — don't tell them that you were doing that 15 years ago and samply didn't know better Instead you are entitled to

put your hands behind your head, prop up your feet and gracrously acknowledge the compli ment with the observation that now you know why you got the big desk .



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MANAGEMENT

George Mitchell

Thinking in circles

reality, hurtling office technolthe designers of modern offices seem to be trapped in a time

We are entering the information age with centuries old trappings. Today's "open plan offices are modern-day sweatshops, with row upon row of rectilinear desks connected by snaking wires and cluttered with telephones, computer terminals and personal computers, printers, files and other sundry

The information age has created an office revolution that parallels the industrial revolu tion. Already, more than 60% of this industrial nation's work force reports to an office building each day, and as much as 90%

will be office-bound by the turn of the century But while the industrial revolution transformed work and the factory workplace, no such transformation is accompanying

Instead, the tools of the in formation trade and their users are being moved - often squashed - into the same old, rectilinear office designs, desoute their dramatically different set of requirements. By think-Continued on page 98 BY DAVID A. LUDLUM

BOSTON - William R. Synnott, the longtime top information systems executive at Bank of Boston Corp. and author of two

books on information systems, will leave the company at the end tant with The Yankee Group. Summet's successor is ready working as Bank of Bostoo's chief information systems executive. John H. Rogers, a former consultant and executive vice-president of Ameritrust

Corp. in Cleveland, joined the communy in October 1986 as di-

vector of cornorate information

and technology, reporting to the

president.



Rogers, 49, brings an emphasis on general banking experience rather than information systems to the top technology post at Bank of Boston, Synnott, 57, who oversaw a decentralization of Bank of Boxton's applications support in 1984 as the corporation was reshaned into five operating groups, is director of corporate information systems and services, reporting to Rogers He strongly supported the de-

centralization of information systems and approached management last summer about retiring om the company. Rogers says Synnott, who wants to work

beyond the age of 65, feels he could do so more readily as a consultant than at the bank and wants to start establishing him self as a consultant now Ropers says. Sygnott declined to comment on his departure Synnott, who took charge of Continued on page 99

Synnott leaving Bank of Boston | Bill would cut system monitoring

BY JEFFRY BEELER

SACRAMENTO Cald - A leg islative committee recently be gan hearings on a proposed law that would drastically curtail the use of systems that monitor the telephone activity and work per

formance of office employee Assembly Bill 1279 (A.B. 1279) took its first step toward eventual passage or rejection when it was beard before the

California Assembly's Labor and Employment Committee Introduced on March 3 to As semblyman Tom Hayden, the bil addresses several categories of electronic munitoring aids, in

cluding the following · Software packages that allow employers to measure the out out of individual workers at their · Devices that enable supervi sors to ran their subordinates

phones and eavesdrop on their · Card readers that track em ployees' comings and goings in company parking lots, building

entrances and the like · Prugrams that flash subhennal messages to office-workers through their personal computer or terminal display screens

A forthcoming report by the Office of Technology Assessment, a federal body, finds that approximately 20% of all terms Continued on page 99

MISTV slated to premier this fall Coverage may include product announcements: 'tech celebs' sought

BY DAVID A LUDLUM

NEW YORK - Information systems managers pleading "I want my MTV" may not be yearning for the music television network due to acute stress, but thinking of MIS TV instead

In September, Private Satellite Network, Inc. (PSN), which operates private television services for corporations and two subscriber networks, plans to launch Insate, a subscriber service aimed at information systems managers PSN plans to limit Insite to gramming a week with a similar volume of reruns, according to Joseph Ruzo, vice-president of business development, who is in charge of insite. "We found that people really need to work while they're at work and not watch television," he adds To date, the company has

identified one Insite show it will penduce Titled Impite Force at is to feature spokesmen for several vendors discussing a tonic such as desktop publishing.

PSN also plans to carry sem es produced by third parties. It has acquired rights to transmit

two to three hours of new profive seminars put on by The Yankee Group, the first two of which will be about Digital Equipment Corp. and IBM, Rizzo says Viewers would receive most

programming through payment monthly subscription charge, although additional payper-view fees might be required to recesso come chour PSN plans to produce about

half the programming itself: the other half will be produced by vendor companies that purchase Insite airtime, Rizzo says. The vendor programs, including product presentations and

Continued on page 100

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bottom line.

Thinking

ing in circles instead of straight ing designers can reduce the pain of today's office revolution

Astonishingly little has been done to accommodate the VDT - the symbol of office automation - and its user despite the dramatic change it is rendering to workers and the nature of

While rising VDT use is not the only factor that cries out for a new office design perspective. the following demands provide dramatic evidence of the need for an entirely new approach to

 The VDT screen must be obugged in not just to a central electrical system but to a widening array of peripherals ones, printers, CPUs and so on. The result is often a snake pit of unsightly - and danger-

 The terminal must be safe to use. The proliferation of desktop machinery puts new demands on ventilation and air-conditioning systems that must offset the heat the machines generate and also refresh the air around workers some of whom are more intensely desk-bound

than ever before Unanswered questions

out radiation emission from VDTs, not to mention fumes from building materials and the concern about "sick buildings also begs for openness on either sude of the screen . The VDT must be easy on the

eves. A video screen is a mirror. The introduction of this eyelevel mirror to the work space is in direct conflict with today's open offices, with their glossy surfaces and windowed walls fortable to use. Ergonomics has entered the design vocabulary faster than it has entered the work space. In 1983, only 6% of all office chairs were ergonomurally adjustable, according to

the National Office Products As-Admistable seating is now the fastest growing segment of the office furniture industry, yet the association estimate that it will only represent 20% of all office seating by 1988.

Work surfaces, another exsential factor in the comfort of VDT users, are still overwhelmingly designed on the desktop-with-typewriter-return configuration, which treats the VDT as an obtrusive add

And with the addition of key

boards, individual printers and other office equipment, the desk has become a cluttered space - not the most conducive to worker comfort or pro-

The bottom line When the requirements of office automation are combined with the cost of office real estate, the case for a re-evaluation of design perspectives becomes

Y TEARING down preconceived notions of what an office should look like, office design can meet today's and tomorrow's space requirements.

even more apparent Space is expensive. After people at represents most compames' largest overhead cost. No cost-efficient, competitive noany can squander space. As space costs increase, the non response is to squeeze the dimensions of each work space. The result is an "ice-cube

tray" design: Rows of rection-

ear cubicles, fitted with components based on the work-surface-with-type-writer-return principle and given a cosmetic coating of current fashion colors Furthermore, change comes

fast and often. More than 30% of all office workers now move from one work space to another each year. Companies can afford neither the time nor the expense of tearing down walls to date these shifts

The solution to date has been open-plan systems furnitems are cast in the mold of their stand-alone forebears. They address the company's need for flexibility at a sacrifice of the

And they are overwhelming ly based on the shapes and dimensions of traditional office furniture. In the hands of trade tion-bound office designers even the most flexible and daverse systems mimic the office

As a consequence of these developments, privacy erodes The actual, physical privacy of an enclosed office — once a prized rung on the ladder of success - is neither necessary nor practical for most office ers today

Yet speech privacy, an accustical term, and the worker's need for territory of his own are increasingly important if productivity is to be main

Traditional, rectilinear office design does not serve this combination of office require ments you more than craft shoes

met the needs of the industrial **Breaking barriers**

By tearing down preconceived notions of what an office should look like, office design can meet today's and tomorrow's office. space requirements

One telemarketing firm was able to accommodate a 36% sncrease in both workstations and workers in its existing space by moving from a typical, rectilinear design of cubicles to one arranged in wedges around a cen tral core. At the same time, each employee's work area in creased from 1,800 to 2,570 sq

The atmosphere of each workstation was more open, yet complaints of interfering noise from advacent stations ended Wiring for the company's vast telecommunications network air filtration, task lighting and acoustical control were all accommodated, unobtrusively in tegrated within the core Continued on page 99

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tems has probably prompted

modest expansion of systems

nott will be a senior director with

the communication and informa

tion systems cornorate planning

service, heading up research and

services for banking and issuing

reports on topics such as linking

Howard Anderson, the firm's

el and little free time. "I was

lucky to have four hours with my

family in the course of a week

he says. "I was sust killing my-

self. There's no amount of mon-

The user's needs --- not the

Linear thinking seldom pro-

designer's aesthetic sense -

Rogers says he gave up con sulting because of constant trav-

strategies, according to

computer strategies to corp

At The Yankee Group, Syn-

personnel, he adds

president

Synnott

the company's electronic data processing services in 1970, has assisted with the transition in leadership "in spades," Rogers

depth of the technical ability Rogers studied political science as an undergraduate at Yale University and finance in getting an MBA from Harvard University. He worked for the finance

insurance subsidiaries of Ford Motor Co. and at Ford for seven years before heading the human resources department at Ameritrust for 10 years.

In 1979, he says, he was 'drafted" to head up Ameritrust's corporate operations, which included electronic and paper processing. He did that until 1983, when he became an independent consultant specializ-

Thinking

The designer did not break

the laws of physics. He broke the rules of tradition. He put his ed to create a beautiful interior behind the performance requirements of the workers and the limits of the space.

ing in what he calls "strategic use of information and strategic use of human resources from a too management perspective.

Transcending groups Rogers says his relatively nontechnical orientation reflects the

Synnott has built at Bank of Boxton. "My role is to address systems issues which are of a corporate nature - issues that transcend the groups, such as architecture, the structure of processing applications, telecor munications issues, network issues, separation of information

and access to information from processing," he says. Bank of Boston, which mamtants a centralized corporate computer center, reorganized to achieve greater accountability and "to get the folks operating the business close to the custom

This is rare. Ton often, the designer's view of performance and aesthetics is at odds with the actual user's view While there may be valid ar-

ments for leaving purely aeshetic considerations to the designer, there are almost none for putting aesthetics shead of worker comfort and performance.

must take precedence. vokes great insights. Maybe architect Frank Lloyd Wright that great lover of circles - was meht after all.

ev that's worth that

Mitchell a regulant of Centercone

Monitoring FROM PAGE 97

are monitored electronically and that the performance evalu ations of 4 million to 6 million of fice workers are based at least partly on computer-collected statistics, according to Sharon Danann, a researcher with clerical umon 9 to 5, the National Association of Working Women

Although A.B. 1279 would ston short of flathy outlawing the practice of electronically montoring worker performance, the bill would bar employers from doing so surreptitionally, according to Hayden's administrative assistant, Judy Corbett

If passed, the proposed leans lation would permit managers to monitor a work group or department's collective output for one hour each day but would forbid the gathering of performance statistics on individual workers. Corbett said

Some of the bill's proposals, especially those governing when and from whom employers can gather performance statistics. are almost sure to meet stiff in dustry opposition. "We expect to hear from the airlines and telephone companies" - two of the foremost practitioners of output monitoring and other forms of employee survedlance Corbett said

The Computer and Business Equipment Manufacturers Association (CBEMA) agreed that employees have the right to be and have access to all pertinent performance records in the

But CBEMA said it opposes efforts to limit the practice to prescribed penods. "The represcribed periods striction to one hour a day would make most forms of computer monitoring impossible. Charlotte Legates, the organization's director of communica-

Responsibility

The association also said it no poses all attempts to halt the collection of performance statistics for individual workers. Such a constraint runs counter to the accepted American principle of holding employees responsible for the quality and quantity of

their work." Legates said. A.B. 1279 proposes an out right ban on the workplace use of subliminal messages

However, Hayden's aides are unable to cite even one instance in which the mind influencing technique is in place

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ALENDAR

APRIL 26-MAY 2

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National Workshop & Computer Dom City, Mo., April 26-29 - Contact: Management Systems Commuttee, American Trucking Associations, 2200 Mill Road, Alexandria, Va. 22314.

1987 Association for Systems Management Annual Conference. Louisville, Kv., April 26-29 - Contact: Richard B. McCaffrey, ASM, 24587 Bagley Road, Cleveland, Ohio 44138

Cinteract '87. San Diego, April 26-30 - Contact: Cincom Systems, 2300 Montana Ave., Cancinnata, Ohio, 45211.

Expo Bank Asia 87 Conference, Osaka, Japan, April 27-28 — Contact: Expo Bank Assa 87 Conference, E. J. Krause & Associates, Inc., Japan, 11-14 Akasaka 3-Chrome Aksoska Bergo Houi 805 Min. ato-Ku, Tokyo, Japan 107.

1987 Association for Inform and Image Management Show. New York, April 27-30 - Contact: Steve Saft AIIM. Suite 1100, 1100 Wayne Ave., St. ver Spring, Md. 20910.

Speech Tech '87, New York, April 28-- Contact: Margo Kelly, Media Dimensions, Inc., 42 E. 23rd St., New York,

Corpcon. Chicago, April 28-30 - Contact: Linda Morris, Corpcon, P.O. Bex 3727, Santa Monica, Calif. 90403, Also being held Sept. 21-23 in Los Angeles

Dexpo South '87. Nashville, April 28-30 — Contact: Expoconsul International, Inc., 3 Independence Way, Princeton,

N L 08540

BMC Software User Group's Second Annual Meeting, Houston, April 29-May 1 — Contact: Marianne Levandoski, AT&T. Room 50-51A40, 30 Knightsbridge Road, Piscataway, N.J. 08854

IBX Users Group Association 12th Meeting. Irvine, Calif., April 29-May 1 - Contact: Ekzabeth Stockwell, Wang Laboratones, Inc., Mail Stop 013-038, One Industrial Ave., Lowell, Mass.

19th Annual International Management Information Systems Confe ence. Cambridge, Mass., April 29-May 1 Continued on page 101

MIS TV

CONTINUED FROM PAGE 97

training segments, will be identified as having been produced by the vendor, and PSN will expect them to have educational value, according to Rizzo, who describes such programs as "marketing communi cations" rather than "hard-core advertis-

We will not permit vendors to come on and do a bard well. They need to be doing education," Ruzo says. Vendors already produce video programs that often are transmitted via relatively expensive portable receiving equipment, he notes.

PSN also may carry product announcements and trade show broad-sets. It has a verbal agreement to broadcast from the upcoming Decapted conference in Boston, according to Ruzo.

Another program concept being condered is user-to-user forums, featuring MIS managers from a major corporation outlining its strategy and taking telephone calls from viewers in a manner Ruzzo likens to Phil Donahue's television "We want this to be talk television. show

Ruzzo says he hopes "tech celebs" such as Yankee Group President Howard Anderson or semmar leader James Martin might bost a series.

PSN is developing an advisory council m part by reviewing program concepts and excerpts. The council now includes Anderson; William Friel of J. C. Penney Co., Dan Cavanuagh of Metroplitan Life Insurance Co.; and William Rush of Prudential-Bache Securities. Inc

The company plans to peg the Insite subscription rate in "the low hundreds of dollars per month" and charge an installation fee of less than \$1,000, Rizzo says. "We're looking to penetrate the market early and fast," he adds.

PSN is targeting a market of 3,500 top corporations that together spend about about \$50 belien a year on information Of those, it hopes to sign 10% before the end of the network's first year, which

starts Aug. I, Rizzo says Initially, transmission will be to the continental U.S. After six months, PSN plans to market the service international

PSN, a privately held New York-based concern, already operates 15 private television networks for internal corporate use as well as subscription networks for profesatonal investors and the legal comnity

"We knew precisely And exactly what to totalled the PC word our demands, it was

Accountants don't have much patience with time-wasting exercises. Which is perhaps why Arthur Young has embraced our word processor from the start. Microsoft* Word for the IBM* PC and compatibles and the Apple Macintosh

Because word processing is used at the management level, they required a command structure that was logical, clear, and uncomplicated. Because demanding secretaries use it, they demanded features in depth. Because they wanted everyone to use it, training had to be comprehensive, quick, and straightfurward. And because all their computers, PC and Macintosh, are wired

together, they needed software that was optimized for n could easily share and automatically convert files creat computer. And that would support IBM's DCA proton formatted files with minis and mainframes.

Then there were a few more givens. It had to she Then there were a few more givens. In get on the printed page.

Of course, it had to lay down vast consultance, multiply, or divide.

And it had to get its me.

When Arthus Kaurt

Continued from page 100

- Contact: Scott A. Baumruck, Paper Industry Management Association. 2400 E. Oakton St., Arlington Heights, El. 60005.

MAY 3-9

AUUA, Inc. (Sperry Users) Spring Conference. Orlando, Fla., May 3-7 — Contact: Gay & Taylor, Inc., P.O. Box 1410, Winston-Salem, N.C. 27102.

BLIS/COBOL Users Group Annual Meeting, Orlando, Fla., May 3-7 — Contact: BLIS/COBOL Users Group, Suite 110, 222 S. Westmonte Drive, Altamonte Springs, Fla. 32715.

Eighth Annual Meeting of the Inter-

national Association of Synercom Users, Houston, May 3-7 -Gary Carson, Synercom, 10405 Corpo rate Drive, Sugar Land, Texas 77478.

Second International Conference on Supercomputing and First World Supercomputer Exhibition. Santa . May 3-8 — Contact: Lana Kartashey, Dynamic Computer Architecture, Inc., Suite B-309, 3000 34th St. S., St. Petersburg, Fla. 33711.

the Healthcare Industry, Dallas, May 4-5 — Contact: Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038. Eastern Communications Forum

87. Stamford, Conn., May 4-6 - Contact: ECF, 505 N. Lake Shore Drive, Chicago, III, 60611

BankAI. Brussels, May 5-6 — Contact: Society for Worldwide Interbank Financial Telecommunications, Al Business Unit, Avenue E. Solvay 81, 1310 La

Hulpe, Belgrum Eighth National Online Meeting. New York, May 5-7 - Contact: Learns

Information, Inc., 143 Old Mariton Pike, Medford N I 08055 18th Annual Meeting of the ASI Us-

ers' Group. New Orleans, May 5-8 -Contact: University of Michigan, Data Systems Center, 2021 Administrative Services Building, Ann Arbor Mich

Second International Optical Storage Forum. Denver, May 6-8 - Con tact: Cartlidge & Associates, Inc., Suite M259 1101 5 Winchester Blvd San

1987 International Conference & Exhibition on Health Industry Bar Coding. Atlanta, May 6-8 - Contact: Automatic Identification Manufacturers 1326 Freeport Road, Pittsburgh Pa 15238

MAY 10-16

APL87. Dallas, May 10-14 - Contact: APL87 Registrar, Suite 210, 440 North lake Shopping Center, DallaS, Texas

VIP '87 - Duquesne Systems In ternational Users Group. Chcago May 11-12 — Contact: Donna Bartko Duquesne Systems, Inc., Two Allegheny Center, Pittsburgh, Pa. 15212.

Audit Managers' Symposium IX, Hilton Head Island, S.C., May 11-13 — Con-tact: Jane Evans, MIS Training Institute 4 Brewster Road, Framingham, Mass

01701 CD-I/The Future Conference. San Francisco, May 11-13 — Contact Carol Peters, Online International, Inc.,

Avenue of the Americas, New York, N.Y. Desktop Publishing '87. San Francisco. May 11-13 - Contact: Carol Peters. Online International, Inc., 989 Avenue of

the Americas. New York, N.Y. 10018 mpany Networks: Strategy and Implementation. New York, May 12-13 — Contact: William Smulsky, The Yankee Group, 200 Portland St., Boston,

e '87 — International Data base Exhibition and Congress Frankfurt, West Germany, May 12-14 — Contact: Messe Frankfurt GmbH. Ludwig-Erhard-Anlage 1, POB 97 01 26. D 6000, Frankfurt 97, West Germany.

Mass. 02114

Avignon 87 — Expert Systems and their Applications. Augnon. France. May 13-15 — Contact: Augnon 87. B.P. 45 92193 Meudon-Cedex France

Network Users Association Spring Meeting. Atlanta. May 13-15 - Con-Network Users Association, Suite 400, 2111 Eisenhower Ave., Alexandria.

Federal Conference on Electronic Publishing, Bethesda, Md., May 13-15 — Contact, Cahners Exposition Group. P.O. Box 3833, 999 Summer St., Stamford. Conn. 06905.

Eighth Annual Computer Law Institute. Los Angeles. May 14-15 - Contact: University of Southern California Law Center, University Park, Los Ange les, Calif. 90007.

Impact 87 - Technology in Tom row's Classroom. Victoria. B.C., May 14-17 - Contact: Conferences Service Continued on page 102



Continued from page 101 Box 1700, University of Victoria, Victoria. B.C., Canada V8W 2Y2.

MAY 17-23

infoweek '87. Dallas, May 17-20 -Contact: Uccel Corp., Marketing Communications c/o Financial Systems Division, P.O. Box 660054, Dallas, Texas sociation 1987 Conference & Exposition. New Orleans. May 17-22 — Con-

The Challenge of Evolving Technologies Conference. Orlando, Fla., May 18-20 - Contact: Scott K. Allen, Lufe Of fice Management Association, 5770 Pow-

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ing New Technology: From Vision to Reality. Los Angeles, May 18-20 — Contact: Michael Hammer. Hammer Fo-Drive, Dallas, Texas 75251. rum West, 5 Cambridge Center, Cam-

bridge, Mass, 02142. Meeting of the Minds '87, ADP Na-tional Accounts Division Users' Conference. Boston, May 18-20 — Contact: Automatic Data Processing.

Suite 580 5665 Northside Drive Atlan ta, Ga. 30328 Patricia Seybold's Technology Forum — Tools for Visionary Business Users. Cambridge, Mass., May 18-20 —

Contact: Patricia Seybold's Office Com puting Group, Suite 612, 148 State St., Boston Mass 02109

Eighth Annual Conference on Appli-cations of Computer-Aided Systems Engineering Tools. Ann Arbor, Mich., May 18-22 — Contact: Rebecca S. Suze more, Meta Systems, Ltd., Suite 200, 315 E. Eisenhower, Ann Arbor, Mich. 48108 Second International Sympo

the Factory of the Future. Montego Bay, Jamaica, May 18-22 - Contact: David W. Russell, Pennsylvania State University Graduate Center, 650 S. Henderson Road, King of Prussia, Pa. 19406.

Western States Government Techlogy Conference 87. Sacramento. Calif., May 19-21 — Contact: Govern-

nent Technology Conference, P.O. Box 160288, Sacrameoto, Calif. 95816.

Technobank. Geneva, May 19-22 — Contact: Technobank. P.O. Box 625, CH-1211 Geneva 1. Switzerland.

Interconnections '87, the Indepen dent Computer Consultants Associ-ation's 10th Annual National Conference. May 20-22, San Francisco -Contact: ICCA, P.O. Box 27412, St. Lou-- Mo 62141

Distribution Computer Expo. May 21-22, Chicago — Contact: C. S. Report, Box 453, Exton. Pa. 19341.

1987 NYU Symposium: Technologi-cal Support for Workgroup Collabo-ration. May 21-22, New York — Contact: Center for Research on Information stems. New York University, 90 Trinity Place, New York, N.Y. 10006.

MAY 24-30

Workshops on Computer-Assisted Map Analysis. New Haven, Conn., May Contact: Joseph K. Berry. School of Forestry and Envi Studies, Yale University, 205 Prospect St., New Haven, Conn. 06511

'87. Washington, D.C., May 27-29 — Contact: Institute for International Research, Inc., Suite 1212, 310 Madison Ave., New York, N.Y. 10017

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COMPUTER INDUSTRY

INSIGHT



Rankings are rite of spring

Ah, spring again. Time for tax return filings, reflections on first-quarter results and a slew of corporate annual meetings.

And it's also time for that an nual end-of-April ritual: the ranking of the U.S.'s largest industrial corporations by Fortune and Forber magazines. As usual, the listings provide a useful benchmark for companing the computer industry's major players with their counterparts in other industries. Although 1986 was certainly not a hanner year for computer firms in general, the outstanding performances of a handful stood out in the U.S.

business world But first, the bad news. Along with everything else that went wrong for IBM in 1986, it also relinquished its long-held mantle as the world's most profitable corporation. Big

Blue's 27% drop in net income to \$4.79 billion brought it down to second place on the Fortune list behind Exxon Corp., which increased profits 10% to \$5.36 billion. But IBM remained com fortably ahead of No. 3 Ford Motor Co. at \$3.28 billion

IBM climbed a notch in sales to No. 4. bulund General Motors Corp., Exxon and Ford To keen things in perspective in this era of IRM-hashing it is worthwhile to point out that IBM's revenue was nearly seven times that of the computer in dustry's No. 2 company, Digital Equipment Corp., whose fiscal year ends June 30. But even IBM is dwarfed by GM, which is double the size of Big Blue and to no one's surprise, is the world's first \$100 hillion com-

In the "year of DEC," the Maynard, Mass.-based IBM nemesis jumped 11 spots to No. 44 on the Fortune 500 sales list and vaulted to No. 24 in net income. Fortes recognized DEC's meteoric 1986 stock market ride as DEC scooted to 17th place in market value from 39th the previous year, DEC's 71% gain in market value was great Continued on page 105

Industry earnings promising

BY ALAN J. RYAN

Struggling Wang Laboratories Inc. last week announced that its earnings for the third fiscal quar ter had surpassed the breakeven level it had targeted for the period, but analysts said the

company should not become overly confident. Meanwhile, the computer industry in general appears to be doing better. NCR Corp. record

ed record sales and earnings for a first quarter, up 17% and 22% respectively from last year. Annle Computer, Inc. posted a 41% re-reason in value and a 6% hike in earnings.

Wang. Analysts said the Lowell, Mass.-based office information vendor's earnings were better than expected. The quarter marked Wang's first quarterly profit of its fiscal year.

Wang posted earnings of \$5.9 milton, a decrease of 72% from last year's thurd-marter earn. ings of \$21.4 million. Sales grew to a record \$745.9 million, an crease of 9% over the \$685.3 million reported in the like quar ter last year

'I didn't think they would turn a profit until the fourth quarter," said John McCarthy of Forrester Research, Inc. in Cambridge, Mass. "This gives [Wang President] Fred Wang

Carthy added that the profitable phen Smith of Pune Webber Orders were down quarter should eliminate ongo-Inc. said. 4's from last quarter and were

ing rumors of layoffs and could egin a turna or the firm However, McCarthy cau tioned, "I don't think anybody should be fooled by these results

sternath

necessary to break even. doesn't exactly suggest a major improvement is under way 1987 first-quarter earnings

actually below the level I thinly



IBM is still sluggish, but NCR, Apple and others show signs of

Wang has some long-term hat - some deep-seated management and organizational problems it is going to take a long

week, Fred Wang said his goal was to cut expenses by \$50 mil hon; to date, his company has cut \$42 million. Wang said the company's European groups have "The thing that concerned said they are unable to cut ex-Continued on page 107 me a little bit in the quarter was

Strapped **BPI** sold for \$10.7M

BY CLINTON WILDER

GARDEN CITY N.Y ... Soul ing to bolster its marker learner. ship in microcomputer accountsoftware, Computer Associates International, Inc. has made a \$10.7 million tender offer to acquire financially ailing BPI Systems, Inc. The acquisition, subject to an

neveral by BPI shareholders would give Committee Associates two accounting product lines to bracket its Easy Business series priced at \$595 per program. BPI sells the Enterprise software se ries for \$795 per module and an entry-level accounting package Continued on page 106

Inside · AMD accuses Intel of non-

compliance with agreement Page 104. · Tundon es ers agreement to acquire Winchester drive maker for \$5 million in

stock. Page 105.

CEO of Silicon Valley power supply vendor. Page 107.

Sorbus says IBM cuts service costs to sell hardware

FRAZER, Pa. - IBM's recently unced service price cuts are primarily a lever to increase sales of its hardware, according to the president of the largest independent computer maintenance firm in the U.S.

Sorbus, Inc. President Louis J. Ross suggested that IBM's ac tion (CW, April 6) was motivated by account control and that IBM is willing to sacrifice its lucrative profit maring on service in order to lock in hardware vales Account control is shifting

from the provider of the box to the provider of the service, and I think this is part of IBM's concern," Ross said in an interview last week. "The fact is, IBM has more success on sales proposals in shore where they have the service vs. shops where they don't. lostead of driving service as a profit center, they are going back to making service support-

In response to IBM's move. Ross said Sorbus will announce a series of price cuts and other service policy changes before the Amendment (CSA) takes effect on June 1. He saud Sorbus will not make across-the-board cuts comparable to IBM's but that the firm does plan to offer a bination of lowered prices

and other customer incentives If I end up outting proces as much as IBM, I don't think I've done my homework," Ross said. Sorbus is not strictly bidding on once anymore. That may have been our strategy initially to penetrate the market, but some companies like ours have proven that there are other advantages

to independent service Ross said that even before the CSA revamp, IBM had become more aggressive on its mainte nance contract terms in some situations, "Historically, it was always, 'Here's the IBM offer now we're never sure when the IBM offer has stopped," he said It's not the way they have normally done business.

In a press conference last



A former IBM service manual suggested that with the new CSA, IBM will begin phasing out its so-called special bids pro gram. 'I think they would like to o out of that business," said Don Goodspeed, now president

sultant Ltd Ross acknowledged that if IRM nersists in lowering both its own profit margins and those of the third-party maintenance industry, Sorbus will attempt to reduce its own cost structure

and intensify its efforts to ser vice non-IBM equipment We know we can't make a silk purse out of a sow's ear Ross said "This is something that has to be managed but we feel we can improve our productivity. We'll try to cut down on what we call 'windshield time where our people are spending more time traveling between

sites than they are repairin To expand its non-IBM busi ness. Sorbus said it hopes to service more Digital Equipment Corp computers through a relationship with Electronic Service Specialists Ltd., a DEC hardware returbisher recently quired by Sorbus parent Bell At-

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with the 1982 agreement.

comment on the matter.

Under the agreement, AMD and Intel

exchanged rights to manufacture each

other's products. Intel, however, has re

fused to transfer its products and to select

according to W. J. Sanders III, AMD's

AMD "Sanders said "AMD has proceed

ed in good faith at all times under the tech

AMD acted as a second source for In-

tel's IAPX86 microprocessor products

and contributed to the ultimate success of those products, Sanders said. "Intel de-

nved unmediate and substantial benefits

in the early stages of this agreement.

They continue to enjoy those benefits in large measure because of AMD's signifi-

cant contributions to the success of the

AMD products it would want in exchang

chairman and chief executive officer.

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AMD: Intel shirked tech swap

IAPX86 family," he added. In addition, Sanders said, Intel is still BY JAMES A MARTIN

obligated to allow AMD to act as a second SUNNYVALE, Calif. - Advanced Micro source for the 8087 and 80386 micro Devices, Inc. (AMD) said recently that Inprocessor technologies, although Intel 13 tel Corp. has not complied with a techn currently able to satisfy the demand for ogy exchange agreement under which Inthose products on its own tel was to transfer to AMD its 8087 math conferences or and 80386 microprocessor

Moreover, the market will require a reliable second source for these devices if they are ever to achieve their full noten As a result, AMD said, it plans to ob-"Sanders said. "We have met all of tral tain an arbitrator to force letel to comply the conditions that entitle us to the rights to manufacture these devices."

In response to AMD's demand for arbi tration, Intel told AMD it intends to ter minate its technology agreement as of April 1, 1988, AMD, however, said royalty payments and existing licenses for products already exchanged under the agreement will continue after the agreement is terminated.

'Intel has shirked its obbigations to Separately, AMD reported a fourth quarter net loss of \$3.3 million, or 6 cents nology exchange agreement." An Intel per share, compared with a year-earlier spokesman said the company would not quarterly loss of \$11.3 million, or 20

cents per share For the fiscal year ended March 29 AMD reported sales of \$632 milion, up 10% from \$576.1 million the year before Net loss was \$95.9 million, or \$1.66 per share, compared with \$36.6 million, or 65 cents per share, in fiscal 1986. The loss included a one-time charge of \$19.9 milhon taken during the second quarter for consobdating operations.

C Language Made Easy To Learn Programmers call it the most comprehensive C course

ever, and first video package they like enough to finish the acclaimed text 'Learning to Program

at a Solicon Valley instruments company. I've never seen programmers get up to speed in C so fast. They get totally drawn in, and they remember everything Grl Roeder of Hands On Learning, who developed this remarkable workshop, says customers like C for its power and porta bility, but hit snags geiting staff up to C can be tricky at first. On the job training is too slow and distracts sencostly, and often disappointing

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SECTION **FOLLOWING THE EMPLOYMENT TODAY** SECTION.

Rankings

CONTINUED FROM PAGE 103

er than all but three of the first 170 firms Unsys Corp. may be touting the power of 2, but it remains No. 3 in the computer industry. The Sperry Corp.-Burroughs Corp. hookup is two slots behind

DEC in the Fortune 500 at No. 46 Rounding out the information industry's entrants on the Fortune 100 are Hewlett-Packard Co., Honeywell, Inc. (in its final year as a computer vendor). Motorola, Inc. and NCR Corp. NCR had the most impressive growth of the lot, moving up from No. 89 to No. 75. Each year, one computer industry vendor seems to burst onto the Fortune 500 with a huge splash. Compaq Com-puter Corp, and Apple Computer, Inc. had their years; in 1986 it was Cray Re-

search, Inc. Checking in at No. 421, the supercomputer proneer also led the entire field m return on sales (20.9%), placed sec ond in 10-year average return to inves tors and sixth in return on assets. Cray's 1986 profit of \$124.8 million was the 500's 127th-best performance, trailing only IBM, DEC, HP, NCR and Apple in

Another notable newcomer to the Fortune 500, at No. 481, was Seagate Technology, Inc., one of the great turn around stories of 1986. Seagate's sales grew 114% in its last fiscal year, the

sorth best growth of any Fortune 500 company. Its return to investors, 164% was second best. Interestingly, another turn-around company, Storage Technol ogy Corp., had the sixth best return to investors on the list - an even 100%.

Seagate, with a 166% gain, also made the Forberlist of the top five market value creases. The firm, along with fellow Fortune 500 newcomers Xidex Corp. (No. 493) and Intergraph Corp. (No 417), is living proof of the industry's vital-ity. The elite 500, however, do not lack

for signs of malaise in several segments of the computer industry Of the list's 71 firms that lost money m 1986, 11 were computer related, starting with Honeywell's \$398 million deficit, which ranked fifth behind four indus

trial grants. The rest of the red-ink lot in descending order are: Control Data Corp., Intel Gorp , Gould, Inc . Nationa Semiconductor Corp., Unisys, Advanced Micro Devices, Inc., Data General Corp., Varian Associates, Inc., Zenitl Electronics Corp. and Computervision Computers also uphor

able profits away from AT&T, whose decline in net income (91%) was the fifth largest of Fortune 500 firms that made money. Ma Bell finished as No. 7 in reve nue but only No. 115 m earnings. And troubled Datapoint Corp., No 458 one year ago, dropped off the list this year

Wilder is Communered currier editor compar

Tandon buys Winchester drive maker

BY JAMES A MARTIN

CHATSWORTH, Calif - Tandon Corp. and but weak that it has entered into a definitive agreement to acquire Winchester disk drive manufacturer Atasi Corp. for about \$5 million in stock.

Separately, Tandon reported its best financial performance in nearly three For the second quarter ended March 29, Tandon's profits jumped 164% to \$5.1 million, or 10 cents per share

Revenue increased 38% to \$80.4 million. With the Atasi acquisition, Tandon said it is seeking to expand the capacity of its need disk drives. Tandon's line of Win chester disk drives ranges up to 50M bytes of storage, while Atasa's storage capacity offers up to 170M bytes

'Adds to Tondon's resources'
'The acquisition will immediately add to

Tandon's own resources an advancednatented technology, a specialized enaneering team and a quality high-capacity product line that would take us consider able time and expense to develop on our Sirjang (Jugi) Tandon, chairman and chief executive officer, said in a state-

The agreement calls for Tandon to issue 400,000 shares of stock in exchange for Atasi's common stock, which is pri vately held. Tandon's stock has been trading at approximately \$5.25 per share. In addition, Tandon will offer approxi-mately \$2.75 million in current Tandon stock to Atari shareholders

Wholly owned subsidiors San Jose, Calif.-based Atası is to be open ated as a wholly owned subsidiary, with its

engineering and research and develop ment consolidated with Tandon, Production of Atasi's 5%-in. hard disk drives is scheduled to continue in San Jose only until the firm is transferred to Tandon's Singarnore facility Several Atası drives are already used

in Tandon's line of IBM Personal Comput AT-compatibles, such as Tandon's PCA 70 with a 70M-byte hard disk 65 employees.

Atasi began operations in 1981 and has



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Pursburgh PA 15212

Miller leaves DG to take over MIPS Computer

Subblier of RISC add-on products names former DG vice-president chairman. CFO

BY JAMES A MARTIN

SUNNYVALE, Calif. - Robert C. Miller formerly sensor vice-president of Data General Corn's Information Systems executive officer and chairman of the brard of MIPS Computer Systems, Inc.,

an OEM supplier of reduced instruction set computing (RISC) add-on products Miller and that his departure from DG over Miller's management responsibilhad nothing to do with the fact that the ities on an interim basis until a replace-

Westboro, Mass.-based minicomputer

rendor has been suffering in the market-My primary reason for taking this job was the opportunity I saw in MIPS, added. "I was happy at DG and I'm still

confident they will be a successful compa-DG chairman ta fill in DG Chairman Edson de Castro will take

ment is hired, according to a DG state-At MIPS Computer Systems, Miller is replacing Vaemond H. Crane, who an-

spokesman said

nounced his resignation in January and denorted in March Crore left due to a difference of opinion with MIPS management, a company

Miller romed DG from IBM in 1981 as nor vice-president of technology and later became semor vice-president for the Information Systems Group.

In that position, Miller was responsible for all DG systems as well as sales devel opment and marketing for the government market

Substantial asset His breadth of technological expertise.

market knowledge and managerial skills will be a substantial asset to MIPS in meeting its objectives to become the dominant supplier of RISC-based products," said Don Muller, MIPS's acting

MtPS focuses on RISC microproces ors that are supplied to OEMs such as

Prime Computer, Inc. and Silicon Graph-The RISC supplier employs 135 peo-

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CONTINUED FROM PAGE 103 for \$295 per module.

Austin, Texas-based BPI will report a loss of about \$2.1 million on revenue of between \$8.5 million and \$0 million for the fiscal year ended March 31, according to Anthony Wang, Computer Associates president and chief financial officer. In the past year, BPI has failed to duplicate its early success in OEM contracts to write software for systems vendors such as IBM, which markets BPI-developed accounting software as the IBM Roomeco

Assistant senes. They have had lackluster performance because of the OEM market drying up." Wang said, "Three or four years ago, a lot of hardware manufacturers were interested in micro accounting soft

Decrete potable failures in the mostice such as Management Science America Inc.'s ill-fated acquisition of Peachtree Software, Inc., one analyst said micro accounting software could be a money make er for Computer Associates

There is no standard established in that market yet, no Lotus Development Corp. 1-2-3," said Charles Taylor Ir. of Prudential-Bache Securities Inc. "Computer Associates has taken the first steps to establishing one, and now they will be twice the size of their nearest competitur in the market By consolidating BPI's operations with

its own micro division in San Jose, Cald., Computer Associates can probably bring BPI to the break-even point fairly quickly. Taylor said. He noted that Computer Associates' certified dealer and installer programs should give BPI the distribution channels and end-user market presence it never successfully achieved on its own, People may look at BPI's recent track record and turn their nose up at the deal but it's a very good acquisition," Taylor

Alex Brown & Sons, Inc. analyst Kennoth Burke also said the acquisition was a positive move for Computer Associates. but noted that BPI will only be a tiny piece of the largest independent software ven dor. "It's hard to make very much of it. given the relative size of the two compa-Burke stated.

Wang said no decisions have been made yet regarding keeping BPI's Austin headquarters, retaining its 130 employees or retaining the BPI name on its product line. BPI's board has approved the acousation and is expected to recommend shareholder approval.

Industry

CONTINUED EDOM PACE 102

penses but plan to produce increased profits to make up the difference. Wang said he expects a solid profit for the fourth quarter and expects the firm to

wang said he expects a solid profit for the fourth quarter and expects the firm to show a 10% after-tax profit margin by fiscal 1990. NCR. Analysis said the Davion. Obso-

based vendor's earnings were also better than expected.

"NCR was probably helped from the declase in the dollar, but this is much better than you can account for just from the dollar," said Donald Young, an analyst with Sanford C. Bernstein & Co. "NCR is really out-performing the industry."

Young said his firm is raising its 1987 pershare profit estimate for NCR based on a strong start for the year. For the quarter, NCR posted income of \$61.5 million, or 65 cents per share, on sales of \$1.1 billion. For the like quarter in

1986, earrangs were \$50.2 million, or \$1 cents per share, on sales of \$960.8 million.

"This marks NCR's sorth consecutive quarter of double-digit revenue growth," said Chairman and President Chairles Except Jr. "Revenue growth as particularly strong in our Europe and Pacific marketing groups, while growth in the U.S. soproved." He added that the U.S. dollar value of worldside mecomine orders post-

Amdahl takes CEO post at power vendor

BY JAMES A. MARTIN

SAN JOSE, Cald. — Gene Amdahl, the founder of Amdahl Corp., has been elected chafe executive officer of Modulir Power Corp., an uninterruptible power supply vendor in Silicon Valley.

Modular Power was founded in 1985

to develop what it expects to be the first electronic motor-generator to offer uninterrupted power to mainframe computers. Its first product, Upstar, is to begin shipment this quarter. Annidah had been serving as chairman

Amount not been serving as chairman of Modular Power and was elected to be the company's first chief executive officer by its board of directors. A pioneer of IBM's 370 architecture,

Amdahl left the company to found plugcompatible mainframe vendor Amdahl Corp. in 1970. He left Amdahl in 1979 and in 1980

acted as a co-founder of Trilogy Ltd., which failed in its expensive effort to develop new very large-scale integration technologies. Amdahl will continue to serve on the

board of Trilogy, which is now essentially a research arm of parallel processor vendor Ebas.

Amdahl said he expects to take "a strong and active role" at Modular Pow-

strong and active role" at Modular Pover.

"In the months ahead, we'll give the industry tangible proof that we have met our very ambitious objectives," he said in ed a "very substantial gain over the first

Apple. In Cupertino, Calif., Apple last week announced that its sales climbed to \$575.3 million for its second guarter ended March 27, compared with sales of

quarter of 1986

40 March 27, compared with sales of 400.9 million a year earber. Earnings were \$33.9 million, or 51 cents per sales compared with earnings of \$31.8 million, or 50 cents per share, last year. The commany said its uncome growth

The company said its income growth was lower than the revenue increase because of an increase in research and development spending to fund new product development.

"This was due to be the last tough

"Ins was due to be the last tough secomparison for the company," said analyst Walter Winnstok of L. F. Rothschild, Unterberg Towbin, "After this period, L.

st earnings companisons should be up. These results should hade well for that "

These results should bade well for that."
Honeywell, Inc. Edson Spencer, Charman and Chief Executive Officer at Honeywell, attributed his company's increase in caruing; to cost-cutting efforts initiated in 1986, including the spin-off of its information systems business to Honeywell Bull Land

In its first quarter as a non-computer company, the Minneapohs-based firm had earnings of \$4.3.7 million, or 96 cents per share, compared with \$36.4 million, or 79 cents per share, a year ago. Sales for the period were \$1.5 billion, up 29% from sales of \$1.15 billion in the like quarter of

Analyst Stephen Dube of Shearson Lehman Brothers, Inc. said, "The results were quite strong, due largely to the strong Aerospace and Defense Drisson. The results do not include figures for Honeywell's computer business although the Honeywell's computer business although the Honeywell Ball joint venture was not formalized until the end of the quarter. Automatic Data Processing. Inc.

Automatic Data Processing, Inc.
Roseland, NJ-based ADP announced an
earnings increase of 23% for its third
quarter ended March 31

Sales for the independent computing services firm for the period were \$373.7 million, up 15% from the prior year's sales of \$324.3 million. Earnings were \$39.3 million, or \$2 cents per share. In the like quarter last year, earnings were \$39.1 million, or 45 cents per share. In the like quarter last year, earnings were \$31.9 million, or 45 cents per share. Sensor writer Ninumary Bubb Maginistic order of the period of th

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EMPLOYMENT TODAY

Healthy economy bolsters MIS

Retailers match consumer spending with computer investments

BY MICHAEL BALL



myestthat retailers are willing to make in their MIS operations. Currently, because people are buying retail items at a healthy rate department store chains are spending more on hardware

In fact, for the last several years, while times have been the corporate face has smiled on MIS in the retail indus-

Retail is very busy and rapidly changing; and that appeals to many data processing people," says loel Montgomery, vicepresident of human resources for Carter Hawley Hale Stores.

At Lord & Taylor in New York, Ray Brizzi, director of technical services says his DP department has grown steadily from a staff of five to 13. His cur-

Inc in Los Angele

he held at W. T. Grant and Co. in the 1970s. Brizin says he was gun-shy of retail after that company folded.

ties in retail for MIS professionals, even though the industry is experiencing a similar increase in the number of takeovers and mergers as many other indus-

For example, Lord & Taylor recently became part of the St. Louis-based May Department Store Co. The takeouse beaught about some changes but was not as fraumatic as some acquisitions in other industries, according to Brizzi. Instead of institut

positions, the new management coor the current staff as indi-The changes that did come ere more in style than in sub stance. Brizzi points out that the additional layer of management

means equipment purchases are now approved through St. Louis Further, in daily operations, New York staff must switch to

rent position contrasts with one - the May style of data handling and reporting. Smaller, independent retail-

ers, such as Toys R Us, Inc. based in Rochelle Park, N.J., are also investing in their MIS oper ations. "In the past four years Toys R Us has had very low turn

says DP manager Paul

to go," Galbeo says. Except for a few peculiarities. the technical expertise retailers demand from MIS employees is similar to that required by other industries. Retailers differ markedly from other industries in their expectations of a DP staff's vel of experience.

growing, we can honestly prom-

ise people that we will promote

from within and there is a place

On the one hand is Los Ange les-based Bullock's, where DP manager Jim Ferry says, "We

HERE are many opportunities in retail for MIS professionals, even though the industry is experiencing a similar increase in the number of takeovers and mergers as many other industries.

ing massive DP staff layoffs Gallico. Perhaps one of the reabecause of suddenly redundant sons for the lack of turnover is that Toys R Us "always gives us enough hardware and software resources to do our job right," Gallico says.

> Moving on up To retain personnel, retailers.

of our people directly out of college but we don't always look for a computer degree," Ferry Bullock's uses its own antiregardless of size, try to offer MIS professionals upward mobil-ity within the firm, "Partly be-

tude test, which Ferry says is a good predictor of DP performance. As a result, the Bullock's MIS department has plucked DP cause we are so young and still workers from their stores as well

want to train our people." Bull-

ock's tends to build exclusively

from the bottom. "We here man

as elsewhere in the corporation Bullock's has turned management trainces into programmers or operations staff

"We want fast-paced, hard working people," Ferry says and we want somebody who has some experience in retailing When you train people, they really understand and are inter ested in your business, and they

As part of its training, Bull ock's pays for external programs and provides its own in-bouse On the other hand, at Toys R Us, computer skills are the first requirement of a new employee Then comes attitude. Gallico

At Lord & Taylor, Brizzi says his employees work well together and share personality traits We demand that they are able to take on different tasks and to handle a lot of things at once," be

The attitude is important at Carter Hawley Hale Stores, too but the emphasis there is external, to the rustomer, "Most fol our DPI people are originally nonretailing environ ments," Montgomery says, "so

we want them more aware of and more responsive to customers

Ball to a free-base writer based in Box-

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CHICAGING Crowson Drector Nor	O L Merrit

ADVEDTICEDS INDEV

Applied Data Research	Language Processors, Inc28
Ansa 30-31	Lawson Associates
AT&T Information Systems . 78	
Attachmate 96	McCormack & Dodge 128
Avatar 23	McDonnell Douglas 14-15
	MCI 98.90
8ay Partners	MCI 98-99 Micom Systems 41
Bridge Communication 26	MicroFrame Inc 58 Micro Main Software . 51
Business Recovery Systems 102	Micro Main Software 51
, , , , , , , , , , , , , , , , , , , ,	Microsoft 35 100-101
Carrier Visions 41	Multisoft 4
Cincom	
Codex 44-45	
Cognos 29	National Advanced Systems. 7 Northern Telecom
Compaq 60-61	Northern Telecom 68-63
Computer Associates 59.88	
Computer Associates 59.88 Computer Technology Group 66	Oracle Corporation
Corporate Class Software 87	
CPT34	Radio Shack 10
UP139	Beatin les
CTS/Datacomm 83 Cullinet	Realia Inc 6- Relational Technology 2- Retrieval Technology 10-
Culinet 18	Petriculal Technology 10
CW Button 65 CW Buy/Sell/Swap 104	Retrieval Tochhology . 10
CW 8uy/Sell/Swap	
CW Circulation 57	SAS Institute. 16-17.4
CW Spotlight	Searchlink 9
	Seiko Instruments . 10
Data 21 58 Data Design Associates 72	Software AG 56/5
Data Design Associates	SPS5 9.
Data General Corp 62	St. Johns Consulting. 5
Data Base Management, Inc. 102	Software Tech & Research
Digital Consultanting 72/73	(STAR)
Digital Equipment Corp. 38-39	Symbolics 84-8
Data General Corp 62	Syncsort
	SAS institute. 16-17.4 Searchlink. 19. Second instruments 10. Software AG 56.7 SPS5. 9. St. Johns Consulting 5. Software Tech & Research (STAR). 1. Symbolics 4. Spincort 5. System Technology Associates 7. System Technology Associates 7. System Technology Associates 7.
4G Data Systems12	Total Communication C
Financial Technology Intl Inc 58	Tandon Computer S Technology Transfer 9
Flagstaff Engineering	Technology Transfer
	Teknowledge
GE/RCA	Telex. 5
Gold Hill Computing 36-37	Telex.
Group Operations	
aroop operations	Unisys 7 Unitech 5
H&M Systems Software 127	Unitech 5
Hem Systems Software 127	
Harris Gov't Electronic	VM Software
Hewlett Packard 67,90-91	VM CMC Helimited 2
	THIS CHIEF COMMITTEE COMMI
8M 65/65	
DEAssociates	Walker Interactive1 Wang Laboratories
nnovation Data Processing7	Wang Laboratories 5
nformation Builders	
ntegral Systems	XA Systems 8
nterlink 94-95	X-Tended Computing 2
TT Information Systems 48-49	

JDS Microprocessing 51

Yourdon

UPCOMING COMPUTERWORLD SPOTLIGHT SECTIONS

Issue Date	Торіс	Ad Closing Date	
May 11	DEC-Compatible Software	April 24	
May 25	PCs — IBM & Compatibles	May 8	
June 8	LANs	May 22	
June 22	Printers - Line & Character	June 5	
June 29	Accounting Software	June 12	
July 6	Manufacturing Technology	June 19	
July 20	Accounting & Financial Software	July 3	

STOCK TRADING INDEX

Computerworld Stock Trading Summary



Last Week	Thu Week	
143.4	138.4	
159.8	152.6	
132.2	128.6	
115.6	111.5	
131.5	126.8	
116.4	113.7	
117.3	116.7	
177.7	170.1	
	143.4 159.8 132.2 115.6 131.5 116.4 117.3	







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19/22	
Peripherals and Subsystems	
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$Bucking \ the \ dip$

IBM, NCR lead computer-stock drive in face of Dow Jones drop

Despite a combined drop of 86 points in the Dow Jones Industrial Average in the first two trading days last week, computer stocks, fucled by better than-expected first-quarter financial results, had an excellent week.

Exceeding analyst expectations and histing at promising signs for the year. IBM jumped 5 points to close Thursday at 150. Wang Laboratories, Inc., reporting a quarterly profit, climbed 1 point to 15%. NCR Corp. rose four points to 65%. Prime Computer, Inc. was up 239 points to a year-long hish of 24%.

Two successful possibly indicating that the against the trend, possibly indicating that the run-up in their stocks in recent weeks may have peaked. Despite reporting strong quarters, Digital Equipment Corp. plunged 9% points in four days to 157, and Tandem Computers, Inc. 1613% points to 67½.

Microcomputer stocks were generally up for the week. The meteoric performance of Microsoft Corp, showed no signs of absting, as the stock gained 2% to 98½. Apple Computer, Inc., rose 1½ points to 71½. But Lotus Development Corp, just hovered near its 52 week high, losing ¼-point to 27. CLINTON WILDER

IBM, industry clouds breaking

BY CLINTON WILDER

Last week's IBM first-quarter financial report showed the first glummering of an upturn in more than a year, sparking cautious

optimism for the computer industry's prospects for this year.

Although IBM reported a 23% decline in profits on revenue that grew 5.5% from the previous year's levels, its perfor-

mistic analyst expectations. The company showed notable manframe sales momentum in March and a surprising volume in Personal Computer sales throughout

Other leading vendo reported generally strong results, fueling an increasingly positive out-look for U.S. capital spending on computer gear. Digital Equipment able winning streak racking up 81% profit poerating margins that increased for the eighth continu quarter to 15.2%. NCR Corp.. Tandem Computers In: Wang Labora tories. Inc and Apple Computer. Inc. all rebetter-than-expected results (see story

page 103)

"I think there was pretty definitive evidence of a possible turnateroid," said analyst Marc Schulman of Salomoa Brothers, Inc. "For the first time in several quarters, IBM Charman] John Akers' istatement delines use the word 'causous' but did include the phrase 'encouraging signs." IBM is still not willing to say it sees an upourn, but laid the groundwork for saying it the next time."

next time."
IBM posted earnings of \$785 million, or \$1.30 per share, well

below \$1.02 billion, or \$1.65 per share, a year earlier but better than analysis per-share estimates, which ranged as low as \$1 Revenue rose to \$10.68 bilbion from \$10.13 billion, while pretax margins fell to 12.5%

Track records Percentage gain i decline in DEC and IBM profits in comparison to year-earlier





from 18.1% a year earlier.

At the high end, IBM reported trong maintrame momentum at the end of the quarter, but analysts were mixed on continued prospects. Nonetheless, a pre-

shysts were mused on continuous prospects. Nonetheless, a predicted pickop in U.S. corporate-capital spending should boost IBM as well as the industry. Capital equipment spending value of 8.8% in the last three quarters, compared with just 4.2% in 1986. according to Data Resources, Inc., a Lexington Mass., economic forcests from Mass.

revising their capital budgets upward, "said David Wyss, Date Resources' senior vice-presdent. "They are optimistic that the economy will overcome the problems caused by tax reform and that export volumes will rise." Spending for macros

Spending for micros fueled IBM's best-ever first quarter for PC sales "I can't remember a period before a major new product cycle where

"I can't remember a period before a major new product cycle where there was less of an impact on demand for the older products." Schulman said. "Anticipation of the Personal System/2.

mand for existing PCs. IBM's first quarrewar also aided by a lower corporate tax rate and the drop of the U.S. dollar. A spokesman said favorable currency comparisons added \$680 million to IBM's revenue

and \$95 million to its carrings. IBM's hardware sales increased 6.5% in the quarter, and income from rentals dropped 25% from the previous year's

pec reported thardquarter earnings of \$307.6 million, or \$2.29 per share, up from \$170.3 million, or \$1.32 per share, a war marlier.

Revenue grew 25% to 82.41 billion from \$1.93 billion in the hird quarter of fiscal 1986. DEC pointed to continued productively improvements, a doubling of its market share in the funnial services basiness and market acceptance of the low-end Microvax 2000 and Vasitation 2000 as reasons for another stellar as reasons for another stellar

"I think the IBM 9370 has stemmed the flow to DEC a little let, but not that much," said analyst Shao Wang of Smith Barney, Harris Upham & Co.

Apollo FROM PAGE 1 dors' systems on Ethernet. Full Ethernet appropr' "allows us to Bect quistomers who have already - sized." The specific of the specific of the specified of

ges cussomers with on awe successy standardazed on Ethernes," Gallap sand, while network independence positions Domain for a "other sates that may be on to-ken-ring and, eventually, fiber cable." Domain will grobably be ported to the Fiber Digital Data for the ported of the fiber Digital Data for the ported of the Fiber Digital Data for the ported to the Fiber Digital Data for the ported of the Fiber Digital Data for the ported to the Fiber Digital Data for the ported of the ported of the ported of the ported of the position of the ported of

Apollo's 802.3 support is of major importance to Boeing Computer Services, according to Boeing manager of network

where you have its sale type device clustered together." he said However, he added that in Boeing's commercial airplane dissaon, "you have people working on Apolloo, PCs, and other vendors' systems all in the same area.

"If everything ran on the ven-

"If everything ran on the vendors' proprietary networks." Wilk added, "we'd have to string four or five different wire types through the same area." In order to achieve its avail of

"everything running native on one type of wire" and on Ethernet. Boeing is encouraging all of its vendors to adhere to networking standards, Wilk said. Domain users on a "moderately loaded Ethernet with 10 to 20 workstations" will experience a response-time degradition of approximately 20% compared with Apollo's proprietary token-ring, Gallup said. Beamning in June, customer's

can order a Series 3000 Personal Workstation bundled with ether the easting token-ring controller or the new 802.3 Network Controller-AT. A Senes 3000 can support up to four controller cards. Additional 802.3 cards will be praced at \$2,000. Such cards for other Domain workstations are said to be

forthcoming

Microsoft picks up pace, jumps ahead of Lotus

BY CLINTON WILDER

Microsoft Corp., nearly doubling its revenue from year-earlier levels, surged past Lotus Development Corp as the world's largest microcomputer software vendor in the quarter ended March 31

Redmond, Wash-based Microsoft had edged shead of Lotus in revenue by \$1.2 million two quirters ago, then slapped back to No. 2 by \$853,000 in the last quarter of 1987. In the most recent quarrer, Microsoft posted sales of \$98.4 million, a \$95% increase from \$505. million a year carber, Profits, restated to reflect changes in Macrosoft's stock-option bonus plan, inreguest 109% to \$22.2 million, 52.2.2 million to \$22.2 million.

or 79 cents per share.
Lotus posted a solid quarter,
but its growth rates were dwarfed by its rival. The Cambridge,
Mass-based spreadsheet leader
said sales rose 22% to \$84.8 million and that profits gained 20%,
increasing to \$13.7 million, or

increasing to \$13.7 million, or 31 centa per shafe. Both firms benefited from stronger than expected sales of personal computer hardware, an evidenced by results reported or expected from IBM. Apple Computer, Inc., Compaq Computer, Corp. and Tandy Corp. But many lysts pointed out that Microsoft is better postuced to ride the hardware wave. "Microsoft has high international exposure, and apply international exposure, and

tem.' said Bruce Johnston of First Boston Corp "Sales of low end PCs benefit them more than Lotus, which is selling primarily

Lotus, which is selling primarily to business."
Goldman, Sachs & Co.'s R ck. Sherhaid said Microsoft's recail sales grew 115% in the quarier and that sales to OEMs increased 65%. "They blew us out of the water on the revenue, as

usual. 'hesaid. In manframe software Managemenf Science America, In. (MSA) reported a 5.52 million. 29 cent persbare kos, manly attribute to the costs of the Comserv Corp. acquisition. Rev. entre beverere, intereased 58% to 54.65 million. The first quar tert is traditionally MSA's slowest, and the firm reported a loss est, and the firm reported a loss of \$41.000 c. 2. cents see

share, a year ago.
Other yendors reporting results last week included the ioi

AT&T. A lowered bottom line helped AT&T post a 26% profit growth compared with year-earlier results that were restated because of an accounting change. But sales of telephone and computer equipment fell 8.5%. Revnue also declated.

dropping 6.7% to \$8.12 billion.
Tandem Computers, line.
The Cupertin, Calif., maker of transaction processing systems continued its recent strength.
Profits increased 8.1% to \$22.4 million, or 46 cents per share, on sales that rose 3.7% to \$242.3

Contel nixes Comsat merger

BY JAMES A. MARTIN

they have the operating sys-

ATLANTA — Contel Corp. said last week that it wants to terminate its previously announced agreement to acquire Communications for the Corp. Communication Communication

cations Satellite Corp. (Comsar) as a result of recent pending actions by the Federal Communications. Commission against Comsit.

Two works ago, the FCC's

Two weeks ago, the FCC's Common Carrier Bureau tentatively ordered Comsat to refund \$62 million to its customers after the agency determined that Comsat had earned more than its authorized after-tax profit margin between 1983 and 1986.

Comsat was designated in 1962 as the U.S. representative to the International Telecommunications Satellite Organization (Intelsat), a consortium of countries that provides international telecommunications service was satellife, and in this subject to FCC regulation.

Other FCC actions pending tions

against Washington, D.C-based Comsat have caused concern at Contel In its investigation, the FCC alleged that Comsat's rate struture was unfounded and ordered

In a letter to the Securities and Exchange Continues on. Contel also cated three other pending FCC acrons against Comsat that would, if enacted, serve to erode Comsat's position in the satellite

communications market place.
The merger, announced in September 1986, would have allowed Contel and Comeat to become one of the few companies that could challenge AT&T in supplying a wide range of fele-

communications services.

In an unusual wast, the larger Counted was to become a subsidiery of Comeat, with Cornel management taking over the merged corporations. The strategy was to maintain Comsail's name in measurational credition.

U.S. vendors braced for tariffs [| N 5 | D 5

Companies plead for exemptions on products essential to their systems

BY MITCH BETTS

WASHINGTON, D.C - The Reagan Administration last week said it would impose purutive tariffs on laptop, portable and desktop computer systems unported from lange, in retalution for alleged Japanese semiconductor chip dumping.

Companies likely to be affected are Toshiba America, Inc., a subsidiary of the Japanese firm Toshiba Ltd., and Data General Corp., selected DG Operat reproses ed from Nippon-Data General

The Reagan Administration said it would not include many computers or mainframes in the tanff ruking, which imposes a 100% additional duty on affected

A preliminary list had includ ed 16- and 32-bit CPUs, disk drives, video display monitors. diskettes and computer tapes. but officials last week out that

U.S. officials had promised that the final list would not include items that are part of U.S. OEM or licensony deals and that it would include only those Japanese products for which there are alternate suppliers

Amdahl, NAS Johhy Earher in the week. Amidabl Corp., National Advanced Systems Corp., (NAS) and Hon-eywell Bull. Inc.—all of which rely heavily on Japanese suppliers-urged the administration

to strike numbrames and disk drives from the tanif list. Otherwise, they said, severe damage to their businesses and layoffs would result

The proposed tantf his a butlet coming straight at the heart of the company," said John C Lewis, president of Sunsyvale, Calif.-based Amdahl. He said Amdahl's contract with its disk

drive supplier, Funtsu Ltd. would force Amdahl to absorb the proposed 100% tariff at a cost of \$100 million this year In Tokyo last Wednesday, the Electronic Industries Associa-

tion of Japan (EIA-I) claimed that the 1986 U.S. Japan chip pact will work if the U.S. government "gives us a chance," calling proposed trade duties dangerous and counterproductive

Speaking to a committee of officials from the U.S. Departments of Commerce, Justice and State and the Office of the U.S. Trade Representatives, EIA-J spokesmen blamed the U.S. gov ernment for not grying last summer's pact time to work.

EIA-J submitted an updated report on Japan's semiconductor market to the U.S. officials. The report maintained that foreign chip makers' shares of the Japa nese market are actually grow ing, while Impanese thro demand is falling.

The tanffs on \$300 miles worth of Japanese electronics products constitute the U.S. government's retabation against Japan's alleged failure to live up to the U.S. Japan Semiconduc-

tor Agreement signed last year ICW April 61.

Commerce Secretary Malcolm Baldinge said the sanctions will remain in effect at least three or four months so that the U.S. can compde enough trade statistics to determine whether Japan is meeting its obligations under the semiconductor trade

The U.S -based Computer and Business Equipment Manu facturery Association (CREMA) strongly opposed the prelimi name list of targeted products because it contained items that U.S. computer vendors import and incomprate into their final

CBEMA asked the U.S. goverament to remove from the obtained by CBEMA companies from Japan and to exempt Japanese products manufactured under a U.S. license, contract or

At a public hearing earlier in the week, vendors sought to have their Japanese-manufac tured components knocked off the tunff has

Honeyweil Bull, based in Min neapolis, said the proposed tariff on 32-bit computers would jeop-ardize its DPS-90 mainframes which it obtains from its Japa nese partner. NEC Corn.

NAS, which gets mainfrancs and disk drives from Hitachi Ltd in Japan, would lose nearly half its business if those products were lat with taniffs, industry an alysts said [CW, April 13]

Computer Consoles ups superminis er 6/32SP replace the Power

BY JAMES CONNOLLY

Power 6/32MP

6/32E and original Power 6/32. The new models were de-IRVINE, Cald. - Computer sugged to be ungraded in the field Consoles, Inc. last week extendto the Power 6/32MP, which reed the technology of its top-end portedly provides customers Superminicomwith a growth path from the puter downward with the an-

Power 6/32E, rated at 5 million nouncement of two Unix-based instructions per second (MIPS) through the 8-MIPS Power 6/32SP to the 1-year-old, 14-

The Power 6/32 and Power 6/32E that they replace were at the lower end of Computer Consoles computer-room systems The Power 6/32EP and Pow

er 6/32SP are scheduled to be avadable in May. Prices reportedly start at \$145,000

Honorable intentions: Even during the week of U.S. posed trade sanctions against Japan, the fast pace of U.S.-Ja-pan iont ventures continued. Computervision last week annced a major agreement with Japan's Toshiba, including the sale of 33% of Computervision's Japanese subsidiary to Toshiba. Toshiba will assemble and distribute Computervision's Caddistation family of computer-aided design plat-forms and work with Computervision to develop a Japanese version of the Caddistation's Unix operating system.

LINES

Secure knowledge. The Networker, Lotus's networking implementation for 1-2-3 and Symphony, is reportedly slat-ed for release in the third week of June. The Networker missed its first-quarter ship date, and last month Lotus offi-cials refused to commit to a second ship date. The product was delayed to correct bugs in two areas: the software that controls the number of counts (users) and file locking. There are about 45 copies of The Networker out in a beta-test version right now.

Share-a-Mac. The West Coast is buzzing with reports about a multiuser version of Apple's operating system, the Finder. According to one source, the multiuser Finder will be announced concurrently with the May delivery of the Mac II which he says is on schedule. Also heating up the arrwaves are continued reports that Apple will bring out token-ring cards for the new Macs, a subject Apple Chairman John Sculley reportedly alluded to during a presentation at a sland connectivity seminar in Chicago last week

sic warm Round 2 Microsoft now even its Onick Base Version 3.0 won't ship until April 30. The date gained new significance when Borland International also revved up to ship its new Turbo Basic, which it has positioned against Microsoft a upgraded product. The software duo is engaged in a features war surrounding their similar compilers, which are also similarly priced at just less than \$100

Lu-ee, Lu-ee, oh yeah. Me gotta go now. IBM's LU6.2 is heating up fast. We've talked to a half-dozen users recent-ly, including a component of the U.S military that is considering LU6.2 as a replacement for its bisynchronous Remote Job Entry connections. But Mobil, which was considering the protocol as a potential connection between its IBM sys s and DEC VAXs, was disappointed to learn that DEC's LU6.2 support currently lacks a corresponding PU2.1 com-ponent. This means that users have to go through an IBM host everytime they use LU6.2 to talk to the VAX. Since the whole idea of LU6.2 is to eliminate the mainframe middieman, Mobil has abundoned its LU6.2 plans — at least un-til DEC gets its PU2.1 act together, a scokesman said.

Cryptic signals. The regional Bell holding compo currently evaluating the nature and extent of user de for more secure local transmission through Bellcore, their research and development arm. Still at the exploratory stage, Bellcore's research may determine whether the hold-ing companies begin offering security features such as encryption with various telecommunications services, or with information services that they would only be able to provide under the looser regulatory regime proposed by the Depart ment of Justice

Low-end lowdown. Tandem is believed to be on the verge of lowering the price of its entry-level EXT10 CPU by 9% in the wake of new low ends being announced this week (see story, page 10). The reduction, slatted for late this month or early May, will reportedly coincide with Tandem's expected announcement of several packaged systems and

Here's a prospect. Sequent Computer Systems is planning a second-quarter rollout of a family of Intel 80386-based multiprocessors capable of 80 MIPS, according to a preliminary prospectus for an initial public stock offering to be made soon by Sequent. The prospectus claims the machines will be fully compatible with the installed base of Se-quent's Balance line of parallel processing systems, which are based on the National Semiconductor 32032 micro-

The Power 6/32EP and Pow-

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